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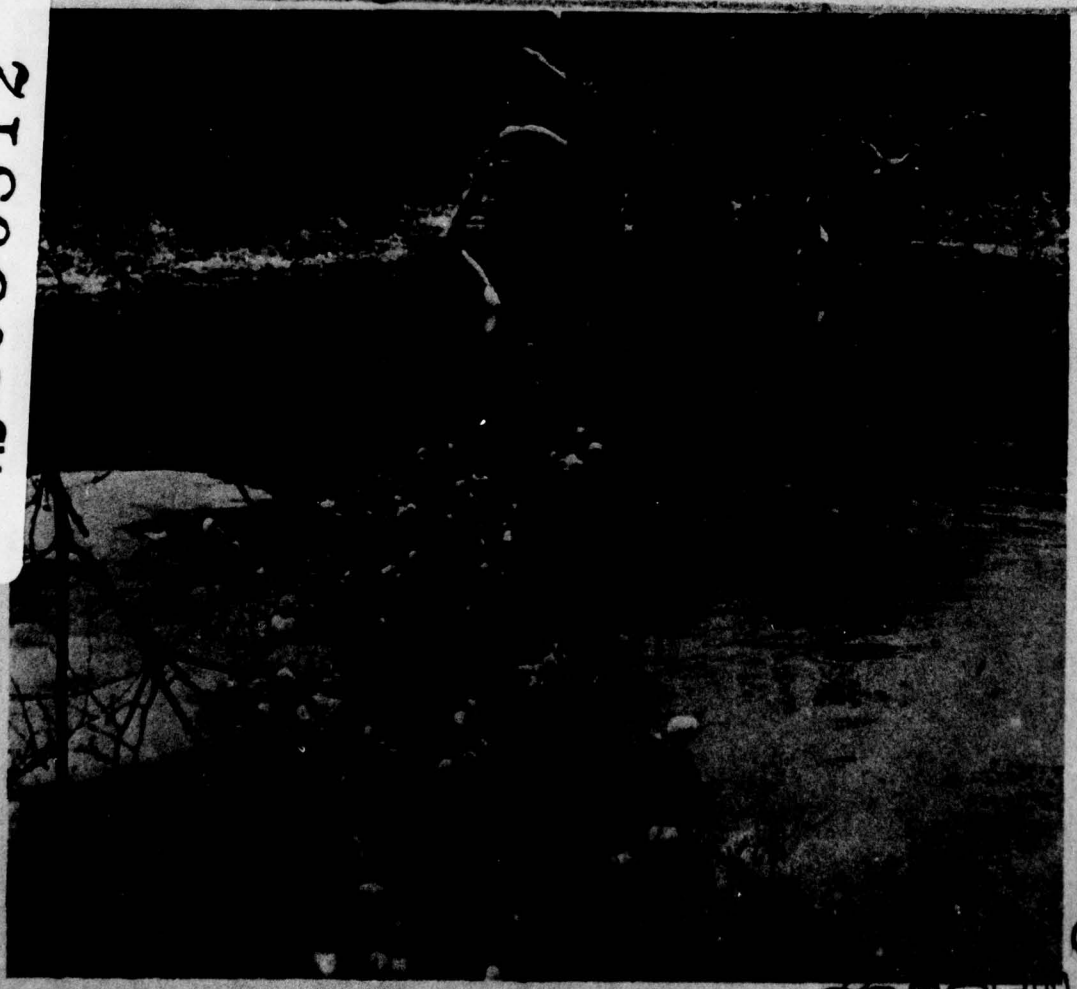
BOSTON HARBOR - EASTERN MASSACHUSETTS METROPOLITAN AREA

EMMA STUDY.

TECHNICAL DATA VOLUME 13D.

VISUAL, CULTURAL AND DESIGN IMPACT ANALYSIS.

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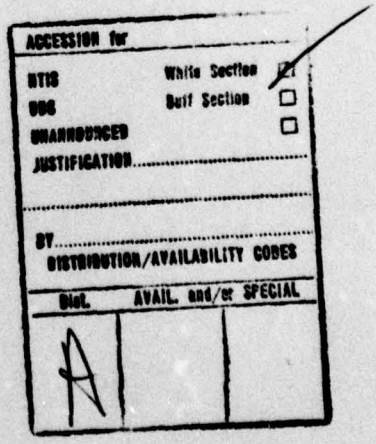
WASTEWATER ENGINEERING
AND MANAGEMENT PLAN
FOR
Boston Harbor - Eastern Massachusetts Metropolitan Area
EMMA STUDY

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IDENTIFICATION AND ASSESSMENT OF VISUAL-CULTURAL AND DESIGN IMPACTS OF REGIONAL WASTEWATER MANAGEMENT

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INTRODUCTION:

The intent of this report is to identify and assess the potential visual-cultural and design impacts resulting from the implementation of any of five regional concepts for wastewater treatment within the Boston Harbor-Eastern Massachusetts Metropolitan Area (BH-EMMA). The report is one of several impact assessments commissioned by the New England Division of the U.S. Army Corps of Engineers. The other assessments consider potential hygenic, socio-economic and ecological impacts resulting from concept implementation.

All of the impact assessments are part of a larger, on going study by the Metropolitan District Commission. The purpose and intent of their study is to investigate the anticipated wastewater problems and needs of the 109 communities within the BH-EMMA, and to propose and evaluate regional advanced wastewater management and treatment concepts for the area in accordance with the goals, objectives and requirements of the 1972 Federal Water Pollution Control Act Amendments.

The MDC has commissioned a consulting engineering firm to develop and prepare four regional concepts for advanced wastewater management and treatment in the BH-EMMA. The central feature of all of these concepts is either the expansion or contraction of the existing MDC Metropolitan Sewerage District, with remaining communities utilizing regional or municipal systems. Many of these municipal systems currently exist, but will require expansion and upgrading of their treatment processes. All of the concepts discharge treated effluent into surface waters. The locations of these discharge points and the subsequent flow volumes in either inland streams and rivers or Boston Harbor varies between the concepts.

The U.S. Army Corps of Engineers has commissioned the development of a fifth concept that utilizes land application as the final advanced treatment process. This concept was prepared by another consulting engineering firm and is based, to a large degree, on the previously prepared Concept Four. Concept Five proposes that five of the regional, advanced treatment facilities in Concept Four be constructed as regional, secondary facilities. These plants will be connected by a mole

tunnel. Effluent will enter the tunnel at the Woburn plant and additional flows will be fed into the tunnel by plants in Medford, Watertown, Dedham and Canton. At Canton, the tunnel ends and effluent will be transported by surface force mains to previously selected land application sites (rapid infiltration and spray irrigation) outside the BH-EMMA. Treatment for areas not served by these five facilities is identical to that proposed by Concept Four.

The focus of the identification and assessment of potential visual-cultural and design impacts will be on the following areas;

1. "The visual impact of proposed treatment facilities and sites on historical, cultural and archaeological sites; open space and recreational areas and significant natural features; and adjacent land uses and development".

2. "The design impacts from the visual-cultural view point of proposed treatment facilities including site plans, architecture, and landscaping of project facilities; public access to water bodies; and relationships to adjacent development".

3. "The consistency of proposed treatment facilities and sites with local, regional and state land use, open space, and historic preservation plans and designs".

4. "The integration of wastewater sewerage systems with existing or planned rights of way and transportation corridors".

5. "The effects of proposed treatment facilities upon the quality of air within the region. The projected resultant air quality shall be discussed in relationship to Federal, state and local air quality standards".

6. "The noise level to be expected from the facilities in relationship to the current noise levels in the area under construction".

Many of the above items are certainly regional in nature. The five concepts were developed as broad, area

wide plans and their level of detail is somewhat consistant with this approach. However, contractual direction has been to concentrate study emphasis on site specific impacts. As such, suggested plant/facility sites, as well as flow projections and area requirements developed for the various contract years (2000, 2020, 2050) have been taken as rather firm contract givens.

In reality, this study will probably raise more issues and questions than it will address and attempt to answer. On its own, its value in determining either the need and/or desirability of a regional approach to wastewater management, or the selection of one concept over another, is minimum. The full value of this study cannot be realized until it is used in combination with other assessments as part of an overall screening and review process. This process may well determine that resultant impacts are too severe, and that the regional concepts should be abandoned. Or, it may reveal the need for the development of another concept; a "hybrid", composed of the best elements from the study proposals. No matter what the final outcome may be, the important point to realize is that the full value of the impact assessments cannot be realized until they are made part of a complete, thorough, and properly weighted screening process.

THE STUDY AREA: BASELINE CONDITIONS

General Description: The BH-EMMA study area is the greater Boston region extending out to its present outer ring of growth, roughly the arc of Route 495. It extends north to Gloucester, west to Northboro, and south to Wrentham and Pembroke. It includes 109 cities and towns in eastern Massachusetts and is approximately coterminus with the mempership area of the Metropolitan Area Planning Council (MAPC). The area contains the Weymouth, Neponset, Charles, Ipswich and "Suasco" River basins along with most of the north and south coastal drainage areas. In 1970, the area had a population of three million, one hundred and twenty-nine thousand, two hundred (3,129,200). Projections for the year 2000 indicate an increase to three million, eight hundred and six thousand (3,806,000).

Development Patterns: The MAPC has divided their planning area into sectors and rings. As the accompanying map shows, the sectors are the Northeast, North, Northwest, West, Southwest and Southeast, each radial from the Core which includes Boston, Brookline, Cambridge, Somerville, Everett and Chelsea. The rings are the Route 128 Inner Suburbs, the Bay-Circuit Intermediate Suburbs, and the Outer Suburbs, the last being roughly defined by an arc along Route 495. As of 1970, 30.2% of the total population was in the core, 34.5% was in the first ring, 27.8% was in the second ring, and 7.49% in the third ring. Except for the decade of the forties, the Core has been losing population while the surrounding areas have been gaining. The areas of most rapid growth have been moving further and further out. During the sixties, the Intermediate Suburbs had 57.8% of all suburban growth. Most significantly, the Outer Suburbs, which previously had less than 10 percent of each decades suburban growth, accounted for over 20 percent of such growth during the sixties, almost matching the inner suburbs. Few of the Towns in the Outer Suburbs are sewered. Thus, the most rapid growth is now occuring in areas which lack sewer service. The distribution and density of such growth within these rings will largely reflect future provisions for sewage treatment. Many areas which can tolerate only low density housing should be much more uniformly developed if the whole region is sewered.

YEAR	CORE	RTE. 128 INNER SUBURBS	BAY CIRCUIT INTERMEDIATE SUBURBS	OUTER SUBURBS	TOTAL METROPOLITAN REGION
1930	-	-	-	-	-
1940	- 18,768	+ 45,628	+ 18,100	+ 2,712	+ 47,672
1950	+ 45,317	+ 96,440	+ 66,002	+ 11,992	+219,751
1960	-136,071	+142,685	+207,545	+ 31,970	+246,129
1970	- 68,740	+ 73,922	+195,171	+ 68,734	+269,087
TOTAL CHANGE					
1930 - 1970	-178,262	+358,675	+486,818	+115,408	+782,639

DISTRIBUTION OF TOTAL METROPOLITAN POPULATION

GROWTH IN EACH DECADE - 1930-1970

SOURCE: Massachusetts Department of Community Affairs

YEAR	CORE	RTE. 128 INNER SUBURBS	BAY CIRCUIT INTERMEDIATE SUBURBS	OUTER SUBURBS	TOTAL METROPOLITAN REGION
1930	1,140,469	741,918	397,574	119,237	2,399,198
	47.5%	30.9%	16.6%	5.0%	100%
1940	1,121,701	787,546	415,674	121,949	2,466,870
	45.8%	32.2%	17.0%	5.0%	100%
1950	1,167,018	883,986	481,676	133,941	2,666,621
	43.8%	33.2%	18.1%	5.0%	100%
1960	1,030,947	1,026,671	689,221	165,911	2,912,750
	35.4%	35.2%	23.7%	5.7%	100%
1970	962,207	1,100,593	884,392	234,645	3,181,837
	30.2%	34.6%	27.8%	7.4%	100%

DISTRIBUTION OF THE TOTAL METROPOLITAN POPULATION IN EACH DECADE - 1930-1970

SOURCE: Massachusetts Department of Community Affairs

YEAR	CORE	RTE. 128 INNER SUBURBS	BAY CIRCUIT INTERMEDIATE SUBURBS	OUTER SUBURBS	TOTAL METROPOLITAN REGION
1930	-	-	-	-	-
1940	-	+ 45,628	+ 18,100	+ 2,712	+ 66,440
		68.7%	27.2%	4.1%	100%
1950	-	+ 96,440	+ 66,002	+ 11,992	+174,434
		55.3%	37.8%	6.9%	100%
1960	-	+142,685	+207,545	+ 31,970	+382,200
		37.3%	54.3%	8.4%	100%
1970	-	+ 73,922	+195,171	+ 68,734	+337,827
		21.9%	57.8%	20.3%	100%
TOTAL ALL REGION EXC. CORE	-	+358,675	+486,818	+115,408	+960,901
		37.3%	50.7%	12.0%	100%

DISTRIBUTION OF SUBURBAN POPULATION GROWTH

IN EACH DECADE - 1930-1970

SOURCE: M. Rege., Massachusetts Department of Community Affairs

In any case, we should not treat the rings as being homogeneous. We should look at patterns of growth revealed by the division of the region into sectors. In the past, the Core and Northeast Sector grew most rapidly. However, over the last several decades rapid growth has taken place in the Western, Southwestern, and Southeastern sectors. The most rapid growth has been in the large coastal portion of the Southeastern sector. Growth increased in that sector by 63.1 percent during the sixties. At present, the two most rapidly growing sectors are the fifth sub-sector of the Southeastern sector, and the whole Southwest sector. The first reflects growth along the coastal area and the impact of the construction of Route 3. Growth in the Southwestern sector presumably reflects the existence of much undeveloped land in that area, as well as a tendency for metropolitan regions to grow towards one another, in this case, towards Providence and New York.

The MAPC and MDC have developed goals, objectives, and policy recommendations in light of these patterns of regional growth. Among these or suggested by these are (1) protection of quality landscapes and an increase in landscape variety; (2) the preservation and improvement of existing open space; (3) a focus of development along well defined corridors to provide maximum possibilities for public transportation and for efficiently used infra-structure investments generally; (4) a need to focus on the metropolitan core in order to preserve and take advantage of the strengths of Boston itself and (5), most basic to the study, the need for improved water quality, particularly surface water quality.

Development Patterns; Proposals: The Metropolitan Area Planning Council staff reviewed soil capabilities, land availability, and transportation within their planning region. Their review included extensive areas of land generally suitable for development, given adequate sewerage service. These areas included swamp, marsh, and areas of steep slope, but not areas of high water table or of poor perculation. The Council staff was also aware of the increasing number of towns requiring lots of one acre or more, and contrasted this to the average half acre per unit common to most new, single family, house construction. The Council decided

to recommend two units per acre as a basic density umbrella for most of the region, with certain areas at a higher density.

The term "density umbrella" refers to an average density for areas to be developed in a given town. It allows for a range of densities, so long as this average is maintained. Furthermore, the average is intended to be a minimum. The intent is to prevent extensive areas of very low density development from consuming vast amounts of land, raising service costs, and precluding preservation of areas for public use.

Another result of the Council's review was the formulation of two alternative development guides. The first, referred to as "Controlled Dispersal Development Guide", assumes that the bulk of the area outside Route 128 would be developed at the basic two units per acre average, while nearly all the land within Route 128 would range from 3 to 4 units per acre, and up. The second, called the "Composite Development Guide", features several corridors of higher, minimum density development running well past Route 128. The eastern most of these corridors extends south from Quincy through Brockton. The southwestern corridor extends southwest from Boston to Foxborough. The western corridor spreads west from Newton through Framingham, to Marlboro and Hudson. Finally, the northern, and northeast corridors extend to Wilmington and Danvers respectively.

Presumbably, the "Composite Development Guide" approach would leave more open land between the development corridors since the higher minimum density required within those corridors would provide for a larger portion of the region's growth. While the Composite Guide would improve connections from the outer area to Boston, it would also facilitate residential development in certain sectors of the closer-in surrounding area. This might strengthen the core as a place of employment and accellerate residential development in the well-served outlying areas.

The Council sees the Controlled Dispersal Guide as concentrating growth in the intermediate suburbs, while the Composite Guide increases growth in the fringe areas and retains more population in the core. In all, the differences between the two Guides are as follows:

1. Density Patterns: The Controlled Dispersal Guide would have seventy-five cities and towns in the basic two units per acre range, 14 cities and towns at 3 to 4 units per acre and 21 at 5-plus units per acre. The Composite Guide has only 48 towns in the low, 2 units per acre range, 24 cities and towns in 3 to 4 units per acre, and 38 at 5 units per acre and above. The Controlled Dispersal Guide would result in a population growth of 942,700, consuming about 128,143 acres resulting in average density from development of about 2.1 units a acre. In contrast, the Composite Guide assumes a growth within the MAPC study area of only 920,000 population (because of portions of the overall growth going to the outer fringe areas outside of the city area). It would house this growth over 113,822 acres, resulting in a average density for new development of about 2.4 units per acre. (To calculate these densities we have assumed an average household the size of 3.4 persons.)

2. Circulation Patterns: The Controlled Dispersal Guide, despite its name, allows for extensive development since it proposes a "circumferential grid" system with extensive improvement to arterial highways. It would result in 617 miles of freeway including the new intermediate circumfrential route running from Route 95 north, to Route 3 south, as previously mentioned. The resulting pattern would give somewhat uniform accessability to the whole region between Route 128 and Route 495.

The Controlled Dispersal Guide recommended limited transit extensions, essentially those in the 1966 MBTA plan, while the Composite Concept included extensive corridors with lines running as far west as Framingham, as far north as Wilmington, and as far south as Norwood, Holbrook and Rockland. Thus the Controlled Dispersal Guide appears to be a "filling in" of suburban areas in preference to either the core or the fringe areas. The Composite Guide is more selective, proposing several radial corridors. These would have both freeway

and improved arterial systems along with the extended transit service. Within these corridors, there would be a higher degree of access than within the region generally under Controlled Dispersal. In all, the Composite Guide would leave us with 519 miles of freeway, and about twice as much transit coverage as the Controlled Dispersal Guide.

3. Employment Patterns: The two guides propose distribution of employment roughly according to their circulation systems. The Controlled Dispersal Guide calls for employment growth at existing expanded industrial parks, at shopping centers along Route 128, at existing, major radial roads, and at points of MBTA access. It also calls for major industrial and shopping expansion in the areas of Routes 95 and 495, for other growth along the new circumfential Route between Routes 128 and 495, and at certain points (Route 2, Route 290, Route 9 and Route 109) along Route 495. The Composite Guide calls for large scale employment growth, particularly within the radial transportation corridors, and near MBTA access points. Existing industrial parks and shopping centers would expand when located near Route 128, other regular highways, or the major MBTA facilities. The greatest concentration of growth would apparently be in the Framingham, Natick, Ashland area. Thus, both guides have a large proportion of growth occuring in outlying areas. The difference between them, as developed through computer simulations, are very slight and somewhat contradictory. Despite the great emphasis on transportation corridors and transit service focusing on Boston, the Composite Guide is predicted to end up with 34.0 percent of all employment in the core, while the Controlled Dispersal Guide has 35.6% remaining in the core.

The differences between the Guides is also very slight with respect to the distribution of employment across the sectors. This is particularly surprising since the difference between the Guides is that the Composite Guide involves concentrating growth in sectors of very high access, while the Controled Dispersal Guide stresses spreading roads and access rather broadly across the suburban and outer suburban areas. Protected population distributions are also surprisingly similar. Thus the Composite Guide has only slightly

more population (23.4 percent) remaining in the core than the Controlled Dispersal Guide (22.3 percent), even though the radial transportation emphasis on the core means that it remains the place from which one can commute to jobs either in the city, or along the corridors of development.

Both guides save considerable amounts of land for growth to continue. The differences between the guides remain less than their similarlarities.*

Regional Landscape Character: The landscape of the BH-EMMA has been described in Appendix N of the North Atlantic Regional Water Resources Study (NAR). Appendix N is titled "Visual and Cultural Environment", and while broad in scope due to the overall size of its study area, it does offer sufficient information to establish a landscape character baseline for the BH-EMMA.

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*By 1990 the controlled dispersal quide would retain 58.1 percent of the inner suburban land, 69.5 percent of the intermediate suburban land, and 84.3 percent of the outer suburban land that was available in 1963. The Composite Guide would retian a larger 62.9 percent of the inner suburban land, and 72.7 percent of the intermediate suburban land, and a slightly small 83.5 percent of the outer suburban land.

Slightly greater difference exist between the plans in terms of the land used in various sectors. Thus the higher density corridors in the Composite plan would leave 64.9 percent of the land in the northern sector still available in 1990 compared to 56.9 percent under the control dispersal plan, and it would leave 71.6 percent of the developable land in the south sector available compared to 66.9 percent under Controlled Dispersal plan. Nonetheless the differences really are not great particularly when the figures themselves are subject to variations that can occur in any set of projections.

The appendix describes various portions of the region in terms of seven landscape series, seven landscape units, and three levels of landscape quality. Eight specific "Composite Landscape Quality Areas" were also designated. "Landscape Needs" were also determined by indicating areas for preservation or protection, and areas needing development of either "quality landscapes", or metropolitan amenities.

In these broad terms, the highly urbanized, relatively level study area was found to have a "medial" overall landscape quality, with few areas to preserve, and a general need for improvement. The improvements needed would increase metropolitan amenities in urban areas and improve landscape quality in peripheral areas.

Landscape Series; are divisions of the landscape which are identified by the general visual impression gained from the repetition of a dominant landform over a large area. They consist of Mountain, Steep Hill, Rolling Hill, Undulating Land, Flat Land, and Coastline classifications. A seventh, the Compound Series encompasses those landscapes which are a product of two series such as parts of the Appalachian Range which alternates between Steep Hills and Rolling Hills.

Landscape Series; Findings: The study area is nearly all in Rolling Hills except for the Coastal areas, and the southern fringe. These, like Cape Cod and the adjoining noncoastal portion of S.E. Massachusetts were in "undulating land". Needless to say, considerable locally significant variation occurs within this range. Marshes, dunes and low hills differ greatly in residential amenity, ecological sensativity, vistas available and their ability to display or hide major facilities. Recent issues in Scituate over the siting of a proposed municipal incinerator indicate the significance of micro-locational differences.

Landscape Units; are identified by consistent ground pattern - the two-dimensional distribution of man-made structures and man-manipulated resources on the landscape. If the landscape is envisioned as a continuum ranging from that which is completely man-made to that which is apparently untouched by man,

Landscape Units represent cross-sections of that continuum. The cross-sections represent: Center City, Intermediate City, Fringe City, Town-Farm, Farm, Farm-Forest, Forest-Town and Forest-Wildland. These units are not separated by definitive boundaries but rather by zones of transition. The names are indicative of the dominant visual image imparted by the landscape so classified.

Landscape Units; Findings: The study area is about 20% in the highly developed "Center City" categories. About 50% of the surrounding area is in "Fringe City" use, which generally follow corridors of access and development. The remaining 30% is in Forest-Town development. This refers to the status of an expanding town generally surrounded by farm land that has returned to forest. It is found in the corners of the regions, particularly in the southwest corner. The adjoining southeastern Massachusetts and Cape Cod areas are also in Forest-Town landscape units.

Landscape Evaluation: Visual landscape quality is defined as a landscape pattern which is clearly legible and which is composed of pattern generating elements arranged so as to maximize visual satisfaction and stimulation in conjunction with the varying degrees of contrast and spatial variety created by the existing landform. The two dimensional distribution of the pattern generating elements relates to and is mutually reinforced by the complexity and magnitude of the landform. These are landscapes which possess great variety in the scale and distribution of open space, forests, lakes, wetlands, urbanized areas and landform. The landscape is relatively free of misfits.

The study put most areas into categories requiring either: preservation of unique natural area; protection of composite landscape; protection of quality landscape; development of quality landscape; or development of metropolitan amenities.

Landscape Quality; Findings: The Center City, Intermediate City and Fringe City areas were not evaluated. Perimeter areas were judged to be of medial quality. These areas are apparently slightly smaller than the areas of Farm-Forest noted above. The adjacent non-coastal portion of southeastern Massachusetts

and the Cape are also in this "medial" quality category. As a result, the study area was generally mapped in the last two categories.

Development of quality landscapes relates to the need for high quality landscapes near population centers. It implies the use of treatment methods that can add needed diversity and clarity to the landscape. Prime examples of such methods include the addition of major water bodies, or the creation of open fields in monotonous forest areas through clearance for agricultural spray irrigation.

The study found little to protect on a regional scale but there are a number of small areas whose protection from development would increase long term landscape quality. This concern could argue for using these areas for land application if the required site preparation and probable subsequent effects of irrigation and harvesting were compatible with open space use of the land.

The development of metropolitan and urban amenities stresses increased access to clean waterways. This can range from major riverside parks like the Charles River Basin, to local hiking trails along the small rivers such as the upper portions of the Neponset or Assebet. Such streamways can be particularly important in developing suburban areas as they often offer the only significant contrast in topography and vegetation from the surrounding development. And, they are often the only "living" feature tieing the neighborhood to surrounding natural areas. Thus, opportunities to improve stream water quality and to increase stream access are both important. Local development policies should protect and use the open space potential of streams.

Open Space and Recreation: The MPAC Open Space and Recreation plan was completed in 1969, and is now under revision. It covers the central 79 cities and towns in the MAPC district and about three quarters of our study area. It excludes the MAPC's "outer suburbs" along with a number of the towns which have since joined the MAPC, and a number of the towns along the northern edge of the study area. However, it includes the areas in which open space acquisition and preservation is most crucial.

The study found that there were about 45,000 acres of visually significant park and conservation land serving the 2,700,000 residents of the study area. These included federal holdings, state parks, land reservations and small facilities of the Metropolitan District Commission, City and town parks, and holdings of semi-public, non-profit groups such as the Trustees of Reservations and the Audubon Society. The study found that "the land is generally well distributed geographically, and is of high quality, protecting essential resources and provides recreational opportunities for many residents of some of the more densely developed communities". In addition, the region benefits from scattered private holdings which are either open to informal public uses such as hiking, picnicing, etc., or are important because they provide an open space setting for local development or compliment adjacent, publicly held, open spaces. However, the future of these areas is uncertain without positive programs to protect them. Thus, an evaluation of the regions open spaces must deal more directly with privately and semi-publicly held lands.

Applying a number of regional open space standards to the Boston area the study found that "by almost any measurement, the study area is seriously deficient in recreation areas and facilities. With a present population 2.7 million, the area should have a minimum of 67,000 acres of major local and regional parks. Only 45,000 acres are now available. This gives the area a present deficit of 22,000 acres. In 1990, the area will have a population close to 3.4 million people. At that time, the deficit will have increased to 40,000 acres unless a new acquisition and development program is adopted". Subsequent population projections are more conservative, but the overall point presumably still holds.

In addition, the study points out that while these needs are for relatively active recreation, there are other open space needs which will require additional acreage. The study comments that, "It is anticipated that the magnitude of open space requirements for conservation, service, institutional, and other exten-

sive land uses will substantially increase the gap between existing and needed open space acreage". Apparently, the concern is that while such uses will increase the apparent open space in terms of regional appearance, the resulting land will not necessarally be available for recreation and other programs may compete for control of land that would otherwise be available for recreation. However, in terms of regional form and character, the extensive holdings for such uses are a considerable asset. The study also notes that while many semi-public holdings, such as those of the Audubon Society, are valuable for special purpose activities such as nature study and bird and wild life sanctuaries, they can not be expected to take the place of general recreation areas. Thus, the report indicates the need for continued acquisition and development of general purpose public open space along with a number of specialized forms of public and semi-public open space.

Open Space and Recreation; Trends: Much of the visual open space of the region is privately held and subject to change. Agriculturial holdings are converted to residential or industrial uses as land values go up, particularly under situations where taxation reflects prospective uses. Yet, it is precisely such agricultural uses that often provide a variety in the visual landscape which is otherwise unavailable in areas of natural forest. The study notes that a survey of private holdings in excess of 50 acres indicated that most such holdings within Route 128 had already been subdivided. This pattern is continuing, affecting not only farms or other commercially held open lands, but some land held for recreational uses, such as golf courses. More generally, land in many of the smaller towns is presently open because of a combination of low population growth, inaccessibility, or inadequancy for septic systems. However, much of this land is under increased development pressure because of increased accessibility. In some cases, such land is held from development largely because of its limited capacity for on site sewage treatment. In these cases existing de-facto open space will be lost more rapidly when town sewerage becomes available. Thus, provisions for extending sewerage should be accompanied by selective and accellerated open space preservation programs.

Additional loses of open space are occuring in areas which might be considered "safe". For example, some marshes and wet lands, though protected by the Hatch-Jones wet lands protection act, have been developed. Most notably, a large proportion of the lower Neponset marshes in Quincy has recently been converted to commercial and high density housing despite its self evident scenic, wild life habitant, and flood control value. Clearly, even a well developed city or town can feel sufficient tax pressure to allow development in areas clearly prohibited by the wet lands protection legislation.

Another trend, one which is as much an opportunity as a threat, is the continuing release of former military lands by the federal government. In some instances, removal of such facilities have led to the creation of new state parks. For example, the Wampatuck State Park on the Hingham - Cohasset, Norwell border, created from portions of the former Cohasset annex of the Hingham Naval Munition Depot, is more useful to the public then it was as an abandoned military reservation. However, some such abandoned facilities can go into private hands, and without effective, coordinated, local planning, are apt to be lost as open space resources. In the case of the Hingham Munition Depot on the Weymouth Back River, portions of the land are going into commercial, housing, and school uses, while the shore line and much of the back land is being retained for public use. However, without broad, local participation, it might have all become a commercial facility resulting in less visual and usable open space.

Open Space and Recreation; Needs: As noted, the study found a need to approximately double the amount of existing open space for general public recreational purposes. Going further, it suggests a total system of about 190,000 acres of land for a wide range of recreation and conservation purposes. This represents the addition of about 145,000 acres to the present 45,000 acres of public land. Some of the additional land would be developed for active recreation and some would be held for natural resource purposes. All of it, along with many privately and non-profit held lands which are open, would add to the visual character of the region, help break up and separate areas of development, and provide continuity between special environmental areas and areas of active recreation.

It is clear that an open space system requires a range of land forms and facility types. As suggested, its purposes include guiding development of surrounding areas, providing for extensively used open spaces, as well as compact, actively used ones, unifying smaller facilities, and giving access to a range of terrain. Also, since the total area proposed is more than twice the projected recreation needs for 1990, extensive portions could probably be used for land application without constraining recreation use. The need for extensive land application sites may coincide with the need for permanent holdings for form-giving use, for wilderness preservation, and for, in effect, land banking for long term public needs.

Open Space and Recreation; Proposals: The MAPC study began by developing an initial plan and open space policy for the whole 152 community eastern Massachusetts region. This plan consisted of a primary system and secondary system. The primary system is based on the most significant natural features and natural resource areas. It includes "the shorelines; the river, streams, and related wet lands; the prominent hills, ridges, and geological formations; and the valuable vegetation and wild life areas". While essentially reserved for conservation purposes, this system would accommodate much of the extensive outdoor needs of the region, and a third of it was already in public ownership at the time of this study. The secondary system includes some land for its location and effects on its surrounds, as much as for its basic character, and considers cultural and historic areas. It also considers the whole 152 community area, but is thought of as a step towards designing a more specific system within the basic 79 community open space study area.

Considering open space and recreation, five possible forms of metropolitan development were proposed. (1) Web; "dispersed urban development shaped by a web of open space. The web alternative is a diffused pattern of open space and low density development that reflects historic patterns of growth and current developmental trends in surburban centers". (2) Wedge; "radial urban development shaped by wedges of open space. In the wedge alternative, urban growth would occur along major radial routes of transportation. Large wedges of low density development and open space

would separate each of the urban corridors and penetrate only to the edge of the core communities". This form of open space will tend to follow from natural growth along corridors. In the outlying areas, it would provide extensive open space areas within fairly close reach of developed areas, but it could leave the charater of the region, as experienced in daily life, unchanged. Residents might well have less sense of extensive open space and fewer glimpses of small scale natural settings than they would encounter in the web approach. (3) Green Belt; circumfrential rings of development separated by green belts of open space. This approach, the most classical of open space approaches, is the opposite of the wedge approach. With a half circle of more or less continuous open space wrapping around greater Boston, it would seem to give a definite edge to the highly developed urban areas. (4) Matrix; satellites of development set in a matrix of open space. The distinguishing feature of the matrix-satellite plan is that sizable community centers would be encouraged to develop outside the core area. This concept assumes that most future development occurs in free-standing "satellite" centers with the area around them remaining as open space. (5) "Composite"; "the proposed open space pattern combines the primary system with the best elements of each of the alternatives secondary systems. Each system of wedges and green belts is proposed to define large scale metropolitan form, while the matrix and web patterns are used to delinate the structure of the open space at a local scale". Thus, the composite scheme has alternating corridors of relatively intense development, and of relatively undeveloped land. The wedges of undeveloped land essentially start at the existing metropolitan parks system. As before, the inner ends of the wedges are "anchored" by existing, new, or extensively expanded regional parks. In addition, two green belts are proposed to separate development in the core and outlying suburban development. The inner green belt is primarily a series of relatively narrow strips of open space linking the major metropolitan parks and extending to the sea at each end.

This overall "Composite" concept was approved by the MAPC council membership in December, 1965 as being the "Initial Plan Open Space Policy". It guided the planning work leading to the present Open Space and Recreation Plan and Program. The Plan itself is rela-

tively consistent with the MAPC's Composite Development Guide alternate. That is, the broad corridors of development are largely those shown for high and moderate density development in the Composite Development Guide. The medium density and low density wedges are generally those proposed for low density development in the Guide. However, more explicit actions in zoning and in open space requisition, as well as in transportation policy, will be needed if the proposed pattern is to remain for any length of time.

In all, there is a broad parallel between the initial Open Space Plan Proposals and the Composite Development Guide, and only a rough parallel between the initial Open Space Plan and the Regional Open Space system which followed from it, three and a half years later. The MAPC notes that the resulting Plan and Program actually calls for a "web-like system of relatively small open spaces linked together by carefully protected large resource areas including the harbor, the rivers, outstanding hills and ridges, and the present open spaces". In many cases, it calls for a continuation of expansion of open spaces within the development corridors since these open spaces are in the sensitive primary system or are particularly attractive. On the other hand, there are areas in which there are few specific proposals, even though the area is indicated graphically as a major wedge of open space and low density development. Presumbably, this reflects the lack of specific opportunities in that wedge. Looked at overall, it seems as though the resulting system would not be perceived by most residents as a system, as much as it would be as a rather abundant supply of open space. People might sense that certain paths of movement lead to, or through, frequent open space areas, while other do not. But even this might not be noticable until the intervening, non-publicly held areas are developed.

Of course, the intention in the open space wedges is not to have the major public open spaces stand out, but rather to have them and adjoining low density privately owned areas run together in an essentially permanent overall pattern. This pattern will become more apparent as the intervening high and moderate density areas continue to fill up. However, this differencial will only continue if the various influences on development are clearly articulated so as

to maintain such a differentiation. Local zoning, public open space policy, state transportation policy, and regional water and sewer policy must be coordinated if such a pattern is to develop and to remain.

The Open Space Plan and Program designate land that should be acquired, protected, or controlled in order to meet public recreation, conservation, and open space needs over the next twenty years. As noted before, some of this land would be for active recreation while the other portions would be conserved for natural resource purposes. The Plan developed a range of "environment categories", each including various types of recreation or conservation activity for a given intensity of use. As explained in the report the catagories are:

1-Intensive use areas: Areas of high accessibility, developed as planned activity centers with a wide range of intensive recreation opportunities. Examples are Nantasket Beach, Hoosichwhisick Pond in the Blue Hills, the Middlesex Fells Zoo, and the Salem Harbor historic center.

2-Moderate Use Areas: These areas are less intensively developed than those in No. 1, but still offer a range of activities. Examples are the Breakheart Reservation, Cochituate State Park and Franklin Park. Portions of these would be intensively developed with specialized facilities. Other portions would remain open land.

3-Natural Environment Areas: These are areas where conservation or protection of the environment is the main purpose, and recreation is more or less informal. Examples are the Blue Hills Reservation, the Rocky Woods Reservation, Cutler Park and the North River wetlands. In many of these areas, there are specific facilities such as ski slopes, ponds, and picnic areas. However, most of the setting will be open. This provides a rough overlap between some moderate use areas and some natural environment areas.

4-Linear Recreation Areas: These are areas where driving, walking or bicycling would be encouraged along parkways or green corridors linking major open spaces and providing opportunities for seeing and using a variety of resources and recreation areas. Examples

would be parts of the Charles River Esplanade, parts of the Mystic Lakes, the Warner Trail and the shores of Walden Pond.

5-Historical and Educational Areas: These might be developed to compliment open space activities, but are essentially developed, cultural, facilities. Examples are the Saugus Iron Works, or the Trail Side Museum in the Blue Hills.

In addition to mapping specific proposals, the Plan and Program state a number of policies for general application across the region. These include the following:

(1) to plan, acquire, develop, and operate at the metropolitan level, recreation facilities designed for metropolitan wide use.

(2) publicly acquire control of all the major inland wetlands, the banks of the metropolitan rivers, and the coastal wet lands and beaches to insure that all have a place to swim, boat, or fish, and at the same time, to protect water resources.

(3) Minimize the travel time and distance between the urban population and a diverse range of recreational facilities with the goal that no household has to travel more than 20 minutes to reach some major metropolitan recreation area.

(4) Provide for multiple uses of open space, extending the approach which has been used for water-shed lands to a wide range of possibilities such as power-line rights of way, commercial parking lots, ski slopes, and other presently single purpose areas.

(5) If necessary, create artifical facilities in resource poor areas to meet recreation or scenic needs, and to improve the character of the landscape. This would apply to development of blighted land in urban areas and to the creation of skating rinks, swimming pools, etc. A prime example of this would be the man-made, but highly effective, pond in the Boston Public Gardens.

While the above policies were to create an adequate quantity of open space in the region, the following are

intended to achieve an adequate quality of open space:

(1) Protection of unique natural areas from urban development and strengthening those areas that are already part of the existing open space system and accessible to the public.

(2) Reclaim inland and coastal waters from pollution and provide for their continued purity in order to meet increasing recreation and utilatarian needs.

(3) (Particularily relevant to our study) provide landscape treatment for the services and utilities necessary to an urban area so that they become complimentary parts of the open space system. The report notes that "extensive land uses including institutions, waste disposal facilities, and utility and highway rights-of-way can be more attractive elements in the development of the area".

(4) Design the metropolitan open space system to the maximum extent possible to give form, structure, and a sense of identity to the urban development that surrounds it. The report notes that open land must be accessible to surrounding neighborhoods, as well as to the region as a whole.

(5) Identify, protect, and where necessary, restore or rehabilitate historical buildings and areas to enhance their meaning and to contribute to the quality and diversity of the region.

Existing Sewerage Systems: As of 1970, 76 of the 110 communities in the Interim Definition MAPC planning area were served by public sewerage systems. This left 34 of the communities, with a population of 290,529, without connections to sewerage systems. An even smaller proportion of the population was actually served since some sewerage systems are simply collection systems releasing raw sewage, and other systems, in some towns, cover only the central portions or particular problem areas. Therefore, the total proportion of the population not served is probably well over the 10.7 percent suggested above.

The vast proportion of this sewage goes to the MDC system. As of 1965, forty three communities with service were tied into the MDC system. The MDC system

serves the Boston core and most of the densely populated communities within the inner suburbs, except for Lynn and Saugus to the north, and Cohasset and Hull to the south and east. However, large parts of Westwood and Hingham are not served by local lines tieing into the system. The MDC system also extends along the rapidly developing west and southwest corridors into the intermediate suburbs. Outlying cities such as Brockton to the south, and Lynn to the north have, or are developing, their own systems.

Existing Sewerage Systems; Core and Inner Suburbs: In terms of the overall coverage, all the core and inner suburb communities are served by either MDC or local systems, with the exception of Weston and Holbrook.

Existing Sewerage Systems; Intermediate Suburbs: The MDC serves the more rapidly growing portions of the intermediate suburban ring. To the north, it serves a portion of Wilmington and the town of Bedford. To the west, it serves Natick, Framingham and a portion of Ashland. In the rapidly growing southwestern sector, it extends as far as Walpole. On the other hand it serves none of the intermediate suburban communities in the southern sector. The bulk of the 24 intermediate suburban communities without sewerage service are in this southern sector. And most of the southern sector suburbs which have service use small, local systems. This is the case in Scituate, Marshfield, Rockland and Bridgewater. These, along with the city of Brockton, are the only southern communities with sewerage systems. although a portion of Abington, as of 1970, drained into Rockland.

Existing Sewerage Systems; Outer Suburbs: As of 1970, eight of the thirteen outer suburban communities had sewerage systems. Some of these covered a very small area, or provided no treatment. Systems were generally found in the older, more developed towns such as Hudson, Milford and Franklin, or in the older and currently rapidly developing towns such as Marlboro. Some of the towns without service are in the paths of development. Southboro has no service, nor does Hopkington, just south of the Mass. turnpike and southwest of Framingham and Ashfield. Simiarly, Foxboro in the southwestern development corridor has a very limited system and the adjoining towns of Wrentham and Norfolk have none.

Existing Sewer Systems; Fringe Communities: Very few of the outlying fringe communities have sewer systems, and most of those cover only portions of the town. Those with systems include Ayer, Clinton, Westboro, Upton (a very small system), and Northbridge.

Existing Sewerage Systems; Changes and Trends: Speaking broadly, perhaps 90% of metropolitan Boston's population is served by sewerage systems, while about about a third of the region's area is so served. In the last ten years the MDC has improved its system by opening the Deer Island Plant. A number of outlying city and towns have developed their own systems. Scituate and Brockton both have relatively new secondary systems and Marlboro has the first teriary system in the region. The outlying systems undoubtably improve water quality where the alternative was dumping of untreated, or only primary treated, sewage into surface streams. On the other hand, the new systems increase the total discharge of treated sewage into the streams by serving properties that would otherwise still have on-site sewage treatment.

The availability of a sewerage system in only some of the outlying towns makes those towns more susceptible to development. So far, sewerage development has not lead to overall development; instead, most towns and cities have been attempting to catch up with system needs, either to respond to the state implementation plan, to minimize present pollution, or to serve their rapidly growing populations.

Currently, several alternative, relatively regional approaches to sewage treatment have been proposed. The range of proposals suggest that all towns and cities in the study area would eventually be served. Those systems may only contact the outer edge of a given town, but the presence of an interceptor at that point would increase the pressure for extensive collection within the town.

The presence of these systems may not lead to development in terms of overall population distribution, but it would certainly change the character of specific towns. A given corridor might grow about the same with or without comprehensive region wide sewage treatment, so long as the main towns in that corridor are sewered. However, the availability of service in a small town

could encourage development in many previously unbuildable portions of the town.

A number of towns seem to have chosen not to have sewerage systems for the time being, but rather to use on-site sewage treatment and relatively large lot sizes as a way of both accomodating some growth and delaying grow generally. As the MAPC has noted, there is a wide arc of towns where there are extensive areas of one arc lots and low density zoning. The net effect is to increase the land required for a given population. As was noted before, the MAPC has recommended an average 2 units per acre for all developable land. This can be achieved with on-site septic systems in areas where soils are appropriate. However, elsewhere it would require sewerage systems unless the overall density were achieved through the use of scattered, very high density, concentrations. In that case, the scattered concentrations of development might use package systems while the intermediate areas could remain with on-site treatment.

Existing Treatment Facilities; Siting and Location: The MDC system consists of an extensive network of interceptors, a number of small pumping stations, the old Mood Island Holding tanks and outfall, and the two large primary treatment plants at Deer Island and Nut Island. The interceptors are underground and generally not visable.

The pumping stations are commonly small facilities occupying less than a house lot. They are generally noticeable and visually incompatible only when they are made with materials strongly out of character with the surroundings, or are fenced off in a way to make them more conspicuous. For example, the plant on Downer Avenue, near Otis Street in Hingham, is conspicuous because it is made of institutional looking tile and fenced off with a high cyclone fence. Previously, the grass around the plant was available for informal recreation and had helped the plant fit into its surroundings. Now, with the high fencing and some recent incongruously decorative landscaping, the facility is more grating and more visually incompatible than before.

The Deer Island and Nut Island plants are both quite large. Though they are only primary plants, they have extensive settling tanks, gas holding tanks,

digesters, control buildings and other bulky facilities. The plants are quite conspicuous due to their locations on hilly peninsulas in view of both boating and residential areas. (This visibility is not in itself a bad thing. After years of polio scares and beach closings, Quincy bay area residents were happy to see the Nut Island plant.)

The third facility in the harbor, the Moon Island Holding Tanks and Pumping Station, consists mostly of low tanks. While the plant dominates the island, it is not too visible (except for its outfalls) from surrounding islands and water. Also, the causeway to the plant provides valuable vehicle access to the center of the harbor, allowing people to fish, hike and generally experience the harbor vistas from a different perspective. However, the calf pasture (Columbia Point) pumping station serving Moon Island is quite conspicuous. It is a heavy, multi-story, 19th century granite structure at Columbia Point and should be considered for conversion to a related public or commercial use if it is abandoned as a pumping station.

The outlying plants are generally conspicuous. They are "water oriented", discharging their effluent into streams. Accordingly, most are located along-side streams in relatively low locations, generally downstream from most intensive development. Surrounding uses are usually related public works or waste disposal facilities, warehouses, or other low value, land extensive operations. Plants located near housing or schools are generally not within the sight of those facilities. This is largely because the plants, using biological treatment, consist essentially of a series of low tanks. Except for an occasional crane for removing grit, or an operations building, most of the facilities are barely higher than the land they are built on. The plants are also inconspicuous from the rivers into which they release their effluent. This is because the banks are commonly overgrown and the closest structures are usually the low chlorination tanks. The most notable aspect of most stream side plants is the outfall itself due to its proximity to the main plant and the resulting foam in the water. In many cases, the most noticable general impact is smell, not from the plant itself, but from sludge dumped on adjoining land. This occurs because a number of modern, secondary plants adjoin excess land containing old, extensive lagoon systems. One often encounters a very

clean, sparkling treatment plant with extensive piles of sludge nearby in its "back yard".

The sites commonly range from five to ten acres. They do not increase rapidly with plant capacity since larger plants use relatively less land for their capacity.

Existing Treatment Facilities; Visual Impact: In all, the visual impact of existing plants is quite limited. As previously mentioned, in many cases the most noticable aspect is not the bulk or width of the plant itself so much as the glare from bright work, metal railings, etc. around tanks and supporting facilities. However, further improvements would result from careful siting of the most attractive elements of typical plants. For example, trickling filters have a positive beauty resulting from the spraying of water over stone while, round, simple sludge digesters, though large, have a pleasing form often compatible with other development. When possible, these elements should be used to heighten the attractiveness of the plants.

In addition, extensive plantings of bold trees between the major plant elements would help break up the monotony of the rectangular tanks. This is particulaly important where the tanks are to be seen from adjoining high ground.

Plants located along the coast tend to be more conspicuous than the inland, water-oriented plants. For example, the Scituate plant, though low lying, is on higher ground than portions of the adjoining marsh and golf course, and is, therefore, relatively conspicuous. (However, even in this case the most conspicuous element is the rarely used grit crane.) With increased planting the facility would remain relatively inconspicuous. Indiginous reeds have grown along the fence providing natural, effective screening. This particular plant has no conspicuous outfall because it uses a sand filter.

While the water oriented plants are generally compatible with their present surroundings, they do little to inhance their surroundings. In particular, they generally do not encourage increased access to the rivers. This is unfortunate since many of the rivers are attractive and have stream side trail possibili-

ties. Though the outfalls distract from the natural quality of the rivers, the treatment plants, nonetheless, provide opportunities for river access that should be exploited whenever possible. One opportunity is in Hudson where the town sewage plant and public works yard run roughly parallel to the Assabet River near a proposed park. Another opportunity exists at the new Medfield plant, now under construction, next to the Charles River. The plant is buffered from the river and the adjoining marshes on two sides by low ridges. Park development on the perimeter could take advantage of public ownership of the site to achieve public access to extensive, extremly attractive portions of the river and the marsh.

Some portions of river banks and shorelines are particularly sensitive. If treatment plants conflict with surrounding uses, other sites, removed from the water, should be considered. If they can meet collection system requirements and be connected to discharge points, such sites would protect these more sensitive water edges and retain them for other potential uses.

Existing Sewerage Systems; Needs: In terms of the potential effects that regional treatment of wastewater may have on water quality, open space, overall land use and development patterns within the region, regional system design considerations include the following:

(1) to control present water pollution problems by providing treatment where there is none, and expanding capacity where present systems are overloaded;

(2) to raise the level of existing treatment plants to meet the required 1977, 1983 and 1985 standards;

(3) to provide adequate treatment in areas where it would be inevitably required by present growth, or by the predictable breakdown of present septic systems. (A corollary of this is the need to inhibit growth, even present growth, in such areas if provision of adequate treatment is infeasible in the near future.)

(4) to take into account and respect local and regional land use plans when progamming wastewater treatment systems. While service should be provided where now needed, or imminently needed, it should not be provided ahead of need in areas which are proposed for low density development.

(5) to maintain and protect present high quality landscapes.

(6) to improve landscape quality when possible and, when appropriate, to add urban ammenities.

(7) to expand usable public open space both by acquisition and by increasing the accessibility and usability of present public or semi-public holdings.

(8) to maintain, or augment, groundwater and surface water levels. This particularly refers to maintaining flow in small streams during summer months.

(9) to protect the immediate environment of the treatment plants and supporting facilities so that overall water quality protection is not achieved at the cost of unattractiveness or lost values in immediately affected areas.

In all then, wastewater improvement systems should meet immediate health needs and probable prospective needs in a way which respects landscape and open space quality, supports regional and local planning effects, maintains or improves groundwater quality and surface water flow levels, and "fits in" with the immediate surroundings.

Existing Sewerage Systems; Proposals: A great many sewage treatment plants have been built in the last ten years. More are being built now to meet Massachusetts water quality standards as required by the State Implementation Plan. More recent federal legislation, the 1972 amendments to the Water Control Act, require even higher standards. By 1977 all publicly owned waste water treatment facilities must meet E.P.A. secondary treatment standards. By 1983 all plants must provide the "best practicable treatment". While the exact standards are not yet clear, it is assumed that the 1983 goal will require most secondary plants to expand enough to provide tertiary treatment. Thus any new secondary systems under design must allow for such expansion.

The contract proposal contains five concepts for regional treatment of wastewater within the BH-EMMA. The concepts all assume ultimate provision of sewage

treatment to every town in the study area. However, in most alternatives, up to nine of the perimeter towns would not tie into a regional system, or systems, until after the year 2000. Thus, the plans do not call for the total sewering of the whole study area in the near future. Nor do they assume the total sewering of each town which is served. In most of the less developed communities, those outside the present MDC district, the population proposed to be sewered in the year 2000 is no more than two thirds or three quarters of the population projected for the year 2000. Cohasset's "low" projection for 2000 is 23,600 while the proposed sewered population for the year 200 is only 8,391. Simiarly, Wrentham's "low" 2000 projection is 10,900 while the proposed year 2000 sewered population is 7,227.

The concepts vary by: a, the size of the area served by the Metropolitan Sewerage District and its Deer Island and Nut Island plants, and b, the degree of centralization or decentralization of outlying systems and c, the methods for achieving tertiary treatment and disposing of effluent. The five concepts, as described in information packets prepared for mid stage public meetings, are as follows:

Concept #1, "Upgrading systems within the present service area of the Deer and Nut Island Treatment Plants". This involves the limited expansion of the Metropolitan Sewerage District to 50 cities and towns by the addition of seven towns which would otherwise be difficult to serve, the creation of 16 regional systems, and the construction, or retention, of a number of individual municipal plants. Two of the regional systems rely on major municipal plants immediately outside the study area, while the rest use new or expanded plants within the area. The concept would cost approximately one billion six million dollars ($1,006,000.000).

Concept 2, "Limited expansion or contraction of the Deer and Nut Islands Treatment Plant Service Areas". This approach reduces the burden on the Deer and Nut Island plants by trimming the Metropolitan Sewerage District of 13 towns located roughly between Waltham, Framingham and Stoughton. It continues to add one town, Lynnfield, resulting in a District of 31 cities and towns. To serve these it proposes five regional

treatment plants in addition to those in concept #1 and deletes one proposed plant leaving an increase of 4. It serves the rest of the region much as concept #1 did and would cost approximately one billion thirty-eight million dollars ($1,038,000,000).

Concept 3, "Maximum expansion of the Deer and Nut Island Treatment Plants Service Area". This would add 15 cities and towns to the existing Metropolitan Sewerage District, extending it as far west as Hopkinton and Southboro, and as far south as Wrentham and Bellingham. As a result it would require only 11 regional plants, some of which, as before, would be expansions of existing facilities. It would cost about one billion one hundred and five million dollars ($1,105,000,000).

Concept #4, "Decentralization of treatment by Construction of additional Treatment Plants within present Service Areas and Systems". This approach contracts the Metropolitan Sewerage District further by deleting 20 cities and towns in a arc running north from Stoughton to Wilmington and west into Framingham and Ashland. To serve this area, it proposes a chain of five regional plants running from Canton, north to Woburn. Elsewhere, it relys on the same regional and municipal plants as the other concepts. Concept #4 would cost about one billion one hundred and twenty-three million dollars ($1,123,000,000).

Concept #5, "Land Application". Concept #5 differs from the others in the method of achieving the required advanced treatment and in the method of disposal of effluent. The inland, water oriented plants discussed above will all provide for advanced treatment and release effluent to nearby streams. In contrast, land application would use soil and plants to provide the advanced treatment and would generally use the land itself for ultimate disposal. (Some land application methods collect the effluent for disposal in water bodies elsewhere) after it flows through the ground. The three basic methods of land application are:

(1) Spray Irrigation. The spraying of effluent over crop or farm land. Most effluent is absorbed into the ground with nutrients removed by vegetation. Other pollutants are filtered or removed by soil action. Some systems collect the effluent for repro-

cessing or release elsewhere, but most leave it in the ground and spray only as much as can be absorbed.

(2) Overland Flow - the release of effluent over relatively impermeable, but well vegetated slopes in which some effluent is treated by micro-organisms on the grass, some is abosrbed into the ground, and the rest is collected for reprocessing.

(3) Rapid Infiltration - The release of effluent into very permeable soils. Most is absorbed and filtered quite rapidly by the soil, but some nutriants are removed by vegation.

Rapid infiltration is more efficient in the use of land than spray irrigation. Spray irrigation can use from 140 to 560 acres for each million gallons a day of flow, while rapid infiltration can handle a million gallons a day on sites ranging from 2 to 62 acres. On a year round basis, a spray irrigation system rated at 2 inches per week for half of the year would treat about thirty-eight hundred gallons (3800) per acre per day. In contrast, the rapid infiltration system would be handling about 33,000 gallons per acre per day. A system depending on spray irrigation alone would require extensive storage lagoons to hold effluent during cold or rainy weather. The availability of rapid infiltration sites should reduce the need for such lagoons. However, the concept calls for almost 3000 acres of storage lagoons at unspecified sites. Also, the concept requires four, 25 acre "equalization lagoons" at the junction of the mole tunnel and the force main in Canton.

In all, the land application concept represents the following: (1) The desire to handle effluent from the Woburn to Canton chain of treatment plants which are projected to produce an estimated 177 MGD by the year 2000. (This includes sewage treated at the Framingham plant under concepts 2 and 4, but added to the Dedham plant under this concept.) (2) The scarcity of extensive sites in the central part of the metropolitan area served by the Woburn through Canton plants. (3) The presence of salt water in sewer lines in coastal areas precluding spray application of such effluent in order to avoid salt build up on the land; and (4) An apparent desire to build an extensive regional system rather than a number of small local systems.

Concept 5 combines spray irrigation and rapid infiltration in an integrated regional system serving the Woburn to Canton plants. It would tie these plants together with a rock tunnel and pipe line system feeding spray irrigation and rapid infiltration sites. Many of the sites include small parcles in several adjoining towns. They are centered around Freetown, Plymouth-Wareham, and Sandwich. The main rapid infiltration site is located on 2,745 acres of federally owned land in the northern part of the Otis Air Force Base (and north of the developed portions of the base), near the Sandwich, Bourne, border. There are two other sites, 365 acres in Bourne, north of the Cape Cod Canel, and 210 acres on the Lakeville, Freetown border. Concept 5 also involves approximately 15,000 acres for spray irrigation. The bulk of this acreage is in the Myles Standish State Forest in Plymouth and in or near the Freetown-Fall River State Forest.

METHODOLOGY

General: The purpose of most environmental assessments is to provide a system or process by which potential impacts that may result from the implementation of a plan action are identified and assessed. The procedure is composed of three basic steps; the development of a baseline condition, generally done with some knowledge of both the proposed plan action and the impacts to be identified and, as such, the baseline is normally tailored and refined to emphasize certain specific elements and conditions; the development of potential or probable impact categories, again, with some knowledge of the proposed plan action; and the identification and assessment of impacts that occur as a result of a plan action, or elements of a plan action, being implemented within the designated study area baseline and time frame.

Some objective methodologies have been developed for the identification and assessment of environmental impacts. However, most are not generally considered acceptable due to their complexity and their lack of a common base and scale rating system. Without a common unified, base and scale rating system, the process of determining the relative merits and importance of objectively identified and assessed impacts in one category, such as visual-cultural and design, against those of another category, such as hygienic or aquatic, becomes subjective, thereby negating much of the value of an objective approach.

The baseline for this report was developed subjectively. The determination of impact categories and plan actions as well as the identification and assessment of visual-cultural and design impacts is also a subjective process. All processes are based upon best professional judgement after visual inspections of both the overall BH-EMMA and the individual, specific sites.

Definitions: Pertinent to any attempt to identify and assess probable visual-cultural and design impacts that may result from the implementation of any of the five project concepts for regional wastewater management within the Eastern Massachusetts Metropolitan Area is the development of definitions for visual-cultural and design.

Visual-Cultural: The visual, physical realities and elements of our environment; the cumulative, sum total of the results and effects of mankind's imposition upon, and manipulation of, his natural environment.

Design: The effect, by way of location, siting, scale, texture, color, and function, of the physical elements of mankind's environment; the impact of the conscious recognition and awareness of the appearance and arrangement of these elements.

As defined, visual-cultural and design impacts are somewhat synonymous and fall under the broad category of environmental asthetics. They represent ranges of compatibility of a proposed action with given base line asthetic conditions.

The Matrix: The visual-cultural and design impacts resulting from the implementation of any of the five project concepts are identified on a matrix. The matrix is composed of columns of plan actions and rows of potential impact categories. The plan actions represent the division of the physical elements of the project concept components into four basic units. They are site selection, design, construction, and operation, and as plan actions, are defined as follows:

Site Selection: The process of choosing the most suitable site for the project action. The success of this process is dependent upon the compatibility of an integrated project program in which the project elements, their function, engineering, design, construction, and operation are harmonious with the physical and social factors of the specific site and the overall region.

Design: The process of refining and developing the project program for the specific site selected. The process involves decisions and selections ranging from general layout and arrangement down to the smallest of details. Total project compatibility and balance is dependent upon this process.

Construction: The physical implementation of the project action. This process includes all major work classifications from demolition and clearing and

grubbing to final grading, loaming, seeding, planting, and other site improvements.

Operation: The completed project action as it functions, its by-products, and its requirements for management and maintenance.

Impact categories are elements or areas of the visual-cultural and design baseline that may be effected by proposed plan actions. They are listed in rows on the matrix and are grouped in two distinct divisions; Region and Site Specific. These divisions represent changes in the level or scale of the identification and assessment process. The Region and Site Specific divisions are each composed of from one to four classifications of general impact types. These classifications contain the specific impact categories. The meaning and general intent of most of the impact categories is evident from their titles. However, some do require explanation.

Region, Planning, land use, general refers to a degree of compatibility and consistency of proposed plan actions with existing, general land use proposals. These proposals include regional open space, recreation, and development plans formulated by the various regional planning agencies and commissions, as well as federal and state planning and regulatory authorities. Land use; specific, refers to a degree of compatibility of the plan action with specific, definite, regional plans and proposals for the particular site in question.

Under Site Specific, Development, type refers to the kind of development in the area; residential, commercial, industrial, institutional, etc. Density refers to the overall visual complexity and area coverage of surrounding development more so than it does to the normally accepted definitions of the term. Character refers to a visual appraisal of the quality and amenity value of the surrounding development. Scale is another visual impression, and refers to the general overall mass and bulk of the elements of the surrounding development.

Impacts are identified on the matrix when plan actions are considered either significantly supportive of, or inconsistant with the visual-cultural and design asthetic baseline. The key work is "significant". Plan action - Impact category interactions that are not

considered as potentially significant impacts are not assessed. Once identified, impacts are assessed by one of the following symbols:

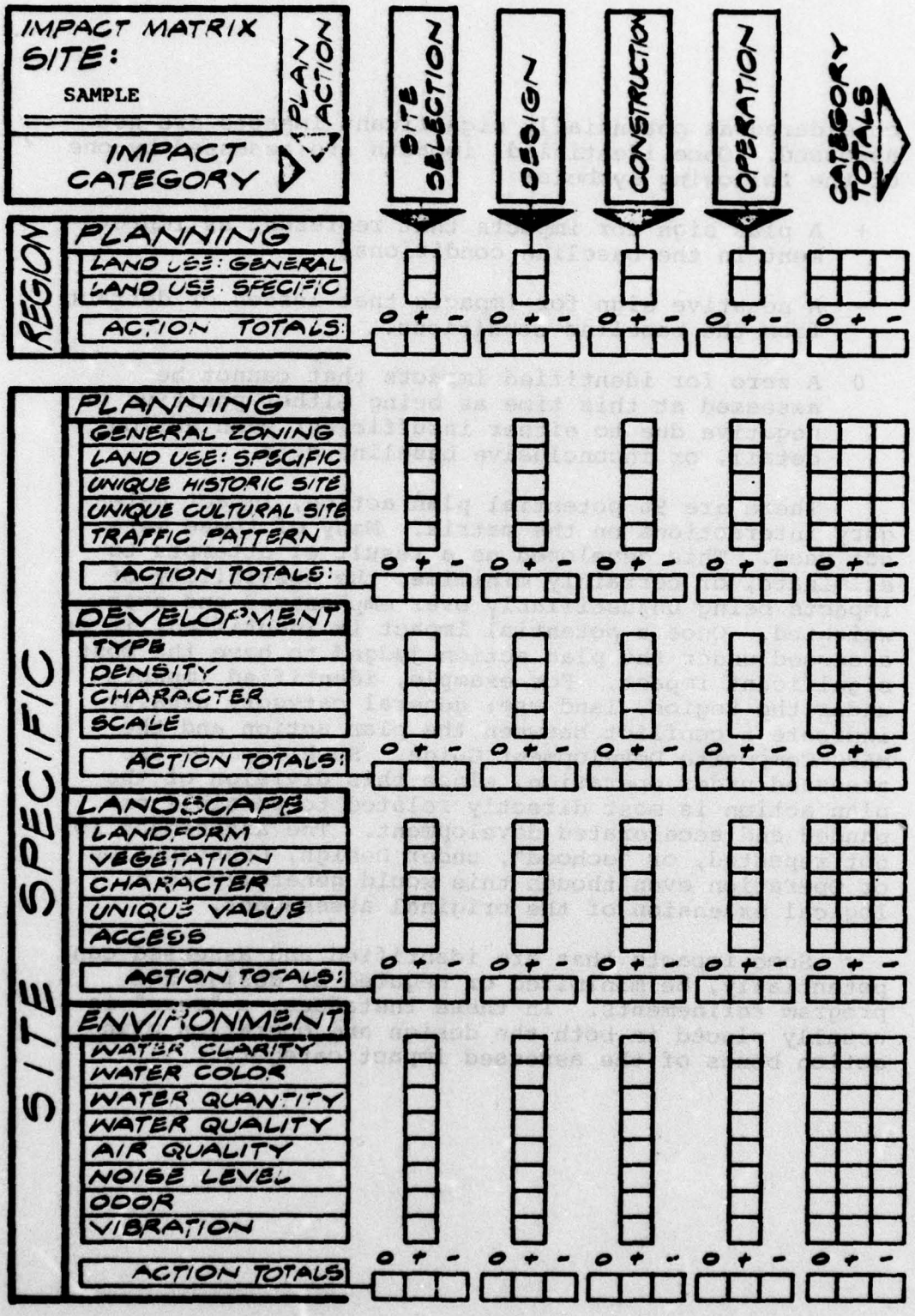
+ A plus sign for impacts that represent an improvement in the baseline conditions.

- A negative sign for impacts that lessen or detract from the baseline conditions.

0 A zero for identified impacts that cannot be assessed at this time as being either positive or negative due to either insufficient plan action detail, or inconclusive baseline data.

There are 96 potential plan action, impact category interactions on the matrix. Many of these were not used. This developed as a result of attempts to eliminate, or certainly minimize, the possibility of impacts being unjustifiably over emphasized and overweighted. Once a potential impact is identified, it is assessed under the plan action judged to have the most significant impact. For example, identified impacts under the Region, land use: general category usually indicate a conflict between the plan action and the MAPC Composite Development Guide. Such impacts are assessed under operation, since this division of the plan action is most directly related to possible expanded and accelerated development. The assessment is not repeated, or "echoed", under Design, Construction or Operation even though this would generally be a logical extension of the original assessment.

Some impacts that are identified and assessed can, potentially, be minimized or negated by design and program refinements. In these instances, a "zero" is usually placed in both the design and operation plan action boxes of the assessed impact category.


IMPACT MATRIX
SITE:
SAMPLE
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

VISUAL-CULTURAL AND DESIGN IMPACTS:

Findings; General: There are forty-four (44) individual plant/facility sites in the five project concepts. This includes the five land application sites essential to Concept Five. A total of nine hundred and sixty-eight (968) potential impacts were identified and assessed on the various matrix forms for these sites. This represents an average of 22.0 impacts per plant/facility site. Of this total number of impacts, three hundred and eighty-eight (388) were zero assessments (40.1% of total), one hundred and ninety-five (195) were positive assessments (20.1%), and three hundred and eighty-five (385) were negative assessments (39.8%).

Total numbers of identified and assessed impacts per individual plant/facility site range from lows of six (Marlborough, East), ten (Marlborough, West and Salem), eleven (Swampscott), twelve (Rockland), and fourteen (Billerica) to highs of twenty-nine (Canton, 95/128 and Canton, North), thirty (Medford and Nut Island) thirty-one (Cohasset) thirty-two (Marshfield) and thirty-three (Lowell). Cohasset, Concord, Deer Island, Essex, Gloucester (Magnolia), Hamilton, Marshfield, Medford, Nut Island, Rockport, Scituate, and Sudbury each have a lower than average number of positive impacts, while Brockton Canton (95/128), Dedham, Gloucester (133), Hopedale, Hudson, Lynn, Manchester, Rockland and Salem each have a higher than average number of positive impacts. Plant/facility sites with a lower than average number of negative impacts are Bourne (East and West), Brockton, Canton (95/128), Chelmsford, Dedham, Hudson, Lakeville/Freetown, Lynn, Medfield, Plymouth/Carver, Rockland (the only site with no negative impacts), Salem and Freetown/Fall River. Those with a higher than average number of negative impacts are Billerica, Canton (North), Cohasset, Concord, Deer Island, Essex, Gloucester (Lanesville), Hamilton, Ipswich, Lowell, Manchester, Marshfield, Medford, Medway, Nut Island, and Swampscott.

A concept by concept comparison of the distribution of total concept impacts (expressed as a percentage of the total number of impacts in the concept) identified and assessed in each of the twenty potential impact category classification/plan action boxes reveals

ASSESSED IMPACTS
SUMMARY SHEET

PLANT/FACILITY	0	+	-	TOTAL
Billerica	2	4	8	14
Bourne East (R.I.)	10	4	3	17
Bourne West (R.I.)	12	6	5	23
Brockton	8	11	4	23
Canton (95/128)	12	8	9	29
Canton North	8	5	16	29
Canton South	10	7	9	26
Chelmsford	8	5	4	17
Cohasset	12	4	15	31
Concord	9	3	17	29
Dedham	10	8	5	23
Deer Island	9	2	11	22
Essex	5	1	11	17
Framingham	14	6	6	26
Freetown/Fall River (S.I.)	10	5	3	18
Gloucester (133)	5	6	9	20
Gloucester (Lanesville)	8	4	15	27
Gloucester (Magnolia)	10	2	9	21
Hamilton	7	1	13	21
Hopedale (milford)	10	8	8	26
Hudson	9	8	4	21
Hull	11	6	6	23
Ipswich	6	2	10	18
Lakeville/Freetown (R.I.)	12	4	5	21

PLANT/FACILITY	0	+	-	TOTAL
Lynn	6	11	1	18
Lowell	8	8	17	33
Manchester	2	8	12	22
Marlborough East	3	1	2	6
Marlborough West	3	2	5	10
Marshfield	14	1	17	32
Medfield	10	4	5	19
Medford	9	3	18	30
Medway	8	1	18	27
Middletown	8	4	7	19
Nut Island	13	1	16	30
Plymouth/Carver (S.I.)	15	6	3	24
Rockland	6	6	-	12
Rockport	12	1	11	24
Salem	4	4	2	10
Scituate	13	2	9	24
Sudbury	11	2	10	23
Swampscott	1	3	7	11
Watertown	12	3	10	25
Woburn	13	4	10	27
Total Impacts	388	195	385	968

Average number of impacts/site = 22.0

many similarities between the five concepts. The numerical difference between the percentage of one concept's impacts in a given box and the percentages of the other concept's impacts in identical boxes is between 9.3 and 1.8. All concepts had the highest percentages of their respective impacts in the same boxes. These impact category classification/plan action boxes are Site Specific; Planning/Site Selection, Development/Site Selection, Landscape/Site Selection, Landscape/Design, and Environment/Operation. The highest percentage of impacts in all concepts is in the Environment/Operation box. However, it should be realized that one reason for this is the constant, positive assessment in the water quality impact category for every plant/facility site in each concept. This is an assumed project given, and is most certainly a significant impact. Deletion of this assessment would reduce the percentage figures in this box by 3 to 4 percent.

Findings; Concept One: Concept One is composed of 31 individual plant/facility sites. They generate a total of 651 impacts for an average of 21.0 impacts per site. Sixteen of the 31 sites are existing facilities, and 2 of these are currently being expanded and upgraded. In addition, four other plants/facilities are in some phase of construction and should be in operation within the next 12 to 18 months. Another four are in various phases of definitive planning and/or design, and should be on the line within 2 to 3 years. This means that 77.4% of the sites in Concept One are either in operation, under construction, or in some phase of implementation. This is especially significant since 28 of the sites in Concept One are included in each of the other four concepts.

Billerica: The existing facility in Billerica serves 15 to 20% of the towns population. The plant is currently being upgraded, and it is assumed that this will remedy some current effluent problems and provide the potential for expanded service.

Significant positive impacts generated by the Billerica plant are its compatibility with development patterns and trends, both existing and proposed, and its resultant effects on the visual quality of the Concord River.

Significant negative impacts are the visual conflict of the plant with the type and scale of the surrounding development, and the potential changes in surface water and vegetation due to an expanded, structured system with resultant changes in percolation and groundwater recharge.

The general landscape of the site specific area is, at best, medial. The plant's control structures are very close to the river bank, but are separated visually from the river by a narrow, dense band of second growth decidious trees. This restricts access along the river bank and removal of this band of trees would provide a better visual relationship between the plant and the river and improve the appearance of this small scale landscape.

Brockton: This existing facility is outside the study area but is proposed to handle flows from Avon, which is inside the study area, and possibly flows from Abington, in the future.

Significant positive impacts related to the plant are its compatibility with regional development patterns, site specific zoning, and the type, density, character, and scale of surrounding development.

Significant negative impacts are the sites proximity to the Taunton River and its possible preclusion of the area for open space and general recreation. These factors, as well as provisions for access to, and along the River should receive priority consideration during the planning of an expanded facility.

Chelmsford: This proposed regional facility would receive flows from the northwestern one third of Chelmsford, all of Westford, and the western one half of Littleton.

The proposal supports general development plans for the region and the plant is consistent with current zoning. With proper design, potential visual conflicts between the plant and the density and scale of the surrounding development can be negated. Careful landscape treatment of the various elements of the plant could improve the character of the site. The site is close to major highways and traffic, either during construction or normal operation, should not be a

significant problem. However, potentially significant negative impacts that could result from the implementation of this proposal are those relating to changes in vegetation, surface water, percolation, and groundwater recharge as a result of the availability and increased use of a municipal wastewater system.

With respect to potential visual-cultural and design impacts, the site appears to be a good choice for the construction of a wastewater treatment facility.

Cohasset: This existing facility serves Cohasset and part of Scituate. It is located on the edge of a salt marsh and is surrounded by an attractive village center and the harbor. James Brook passes through the site on its way to Cohasset Cove. The plant is fairly well screened by structures and vegetation, but is visible from the harbor.

The only significant positive impacts generated by the facility are its effects on the color, clarity and quality of the surrounding tidal waters. This should improve recreational activities such as swimming, boating and fin and shell fishing.

The plant generates many negative impacts. Its location on a salt marsh is a threat to the vegetation, character and value of a unique environmental resource. The plant is inconsistant with surrounding development types. It is also out of scale and character with adjacent development, but this can be minimized by careful design of the upgraded and expanded facility. Construction traffic during expansion could be a significant problem, especially during the summer months. The plant is somewhat inconsistant with regional development proposals for the area and it introduces many variable impacts associated with increased surface runoff, reductions in natural percolation and vegetative succession.

Concord: This is an existing facility occupying about 30 acres. The proposal indicates that it will treat influent from Concord, Avon, Maynard, portions of Littleton, and Boxborough after the year 2000. The existing site is flat, surrounded by dense woods, and has extensive views down to the Concord River and the

adjacent Great Meadows National Wildlife Refuge.

Significant positive impacts resulting from the facility are its effects on the appearance and quality of the Concord River.

Significant negative impacts generated by the plant are its inconsistancy with regional development proposals, secondary impacts related to increased use of an expanded municipal wastewater collection system, and general visual incompatibility with the type, density, character, and scale of the surrounding development and natural landscape. Much of the potential impact on landform, vegetation and general landscape character can be minimized during the design process, but the impacts of a major construction program (erosion, siltation, dust, etc.) on the adjacent wildlife refuge could be very significant.

Deer Island: The Deer Island facility provides primary treatment and some chlorination for approximately 340 mgd of influent from the 22 communities in the MDC Northern Metropolitan System. This flow is projected to increase to approximately 380 mgd by the year 2000.

The plant is located on an island which is connected to the mainland (Winthrop) by a causeway along Yirrell Beach. Deer Island projects into the harbor opposite Long Island, and the two islands combine to produce a natural gut in President Roads, the main shipping channel into Boston Harbor. The islands also provide a natural definition and enclosure around the periphery of the inner harbor.

The most significant positive impact associated with the upgrading and expansion of the plant is the potential for more extensive, better quality, water oriented recreation due to the improved quality of the discharged effluent. However, there are several other pertinent factors related to increased recreational uses of the waters in and around Boston Harbor. Tidal flows, particularly as they relate to other sources of pollution in the harbor, changes in water temperatures and chemical composition resulting from increased discharges of improved effluent, and increased and improved access to the harbor for the general public are

some of the principal issues that must be resolved before the harbor's recreation potential can be maximized.

There are several significant negative impacts associated with the expansion and upgrading of the Deer Island facility. Being an island the site is unique and has the potential for a wide variety of recreational uses. It is highly visible and offers impressive views and a variety of visual experiences in all directions. Plant expansion will restrict the sites recreation potential (the extent of this restriction is a design variable) and will certainly have a severe impact on the islands natural land form and visual significance. Expansion will compound the current problem of conflicting land use (municipal, correctional, military, recreational) and will probably result in the destruction of Fort Dawes, a military installation that many consider historically significant. Expansion may involve filling portions of the harbor and/or Broad Sound, and while this approach may minimize some of the land use conflicts, it does present a variety of new and potentially significant impacts. A major construction project, as well as increased service and staff requirements, will certainly compound an already dangerous traffic volume and route to and from the plant.

Essex: Construction of the wastewater treatment facility in Essex is expected to begin within the next 12 months. Plans and specifications have been finalized and the project is waiting for final approvals.

The plant site is on the edge of a vast, saltwater marsh and, as such, the proposal represents an intrusion into a unique environmental resource. The site is highly visable, and the plant will conflict with the type and density of surrounding development if the extension of single family residences continues towards the edges of the marsh. However, proper site design and effective, complimentary screen plantings can minimize these potential impacts.

Overall, the site is marginally acceptable for the construction of a wastewater treatment facility, and potential visual-cultural and design impacts of the completed plant are resolvable, given adequate design considerations.

Gloucester (133): Construction of this proposed treatment plant is expected to start by the end of this year. The facility supports regional development proposals for the area, and also satisfies the needs of an older, densly developed community. The site is a tidal, backwater marsh. It is open and highly visible. While construction of the facility and subsequent planting may provide a needed visual variety in an otherwise medial micro landscape, it will result in an almost complete destruction of a unique environmental resource. Also, due primarily to the openness and high visibility of the site, the plant will be out of scale with surrounding development.

With respect to potential visual-cultural and design impacts, this site is not recommended for the construction of a wastewater treatment facility.

Gloucester (Lanesville): The proposed site for the Lanesville facility is on the shore of Lanes Cove. The cove is a small anchorage area formed by massive, rectangular, granite blocks stacked together to form a breakwater. Surrounding development is a mixture of older single family homes and some small stores and shops. Roads are narrow and winding, and the topography is very steep and irregular.

The most significant positive impact generated by the proposal would be a reduction in the area's dependence on either on-site disposal or direct ocean discharge.

Significant negative impacts involve potential conflicts between the facility and the type and character of surrounding development, the proximity of the plant to a unique and picturesque setting and possible disruption of the existing traffic pattern, especially during construction. With prevailing on-shore breezes, odor and noise are also potential conflicts. However, since the proposed plant is small and the character and visual quality of the area is man-made and very geometric, a properly sited and designed facility should compliment the area. Two important design considerations would be the plant's proximity to, and intrusion into, the visual confines of the cove and the need to maintain current levels and paths of access to both the cove and enclosing breakwater.

With respect to potential visual-cultural and design impacts, the site is adequate for the construction of a properly designed wastewater treatment facility.

Gloucester (Magnolia): Plans for a proposed plant in the Magnolia section of Gloucester are currently being revised. No firm site has been chosen and there is a possibility that the eventual plant may receive some flow from sections of Manchester, as well as its own sub area of Gloucester. However, the area has perhaps the most scenic coast line in Massachusetts, and the homes and estates in the Manchester, Magnolia area are comparable to the finest in New England. The landscape is steep, irregular and heavily wooded. Any plant in the area will have to be carefully sited and reflect a sympathetic design solution in order to avoid potential visual impacts and incongruities.

Hamilton: This proposed regional facility will treat flows from Hamilton and Topsfield, plus additional flows from Wenham and Boxford, after 2000. The site is a triangle of land formed by the intersections of 3 rural roads.

The proposal appears to be inconsistant with regional development plans for the area. Secondary impacts to surface waters, vegetation and groundwater recharge resulting from increased use of municipal wastewater systems are potentially significant throughout the entire service region.

The plant would not be compatible with existing zoning, the type, density, character and scale of surrounding development, as well as the vegetation, land form and general character of the immediate landscape. While some of these site specific impacts could be minimized by a responsible design solution, remaining impacts would still be very significant. This site is not recommended for the construction of a wastewater treatment plant.

Hopedale (Milford): This existing plant serves over 90 percent of the Town of Milford and discharges approximately 3 mgd into the upper Charles River. This discharge is well below the plants design capacity of approximately 4 mgd. However, the effluent is reported

to be below acceptable standards and the plant is under court order to stop discharges into the river.

Significant positive impacts generated by the upgrading of this facility would be the improved visual appearance of the river and the removal of the old lagoon areas which are currently being used for sludge disposal. Removal of these lagoons will be somewhat dependent upon the area requirements of the process used to achieve advanced treatment. However, the existing lagoons currently represent a significant negative impact, both visually and by the odors they emit, and they should be removed, and the area regraded and planted, even if their total elimination is not required by the selected advanced treatment process.

Hudson: This existing plant provides secondary treatment for over 90 percent of Hudson. The plant reinforces regional development and growth proposals and it is compatible with surrounding development and general land uses.

Potential negative impacts are associated with the expansion and upgrading of the facility. Expansion should be designed to minimize the plants potential dominance of the river bank and the upgraded facility should not restrict access to, or along the river.

The expansion and upgrading of the existing facility should produce a significant positive impact; the removal of existing lagoons. Details pertinent to the removal of these lagoons are identical to those contained in the discussion of the Hopedale plant.

Hull: Contract drawings and specifications for the construction of a wastewater treatment plant in Hull should be completed early next year. Construction should be underway by mid summer, at the latest.

Significant positive impacts generated by the facility are its compatibility with regional proposals for general development and the service it will provide to a fairly dense residential community that is dependent upon either individual, on site systems or direct ocean discharge. With proper siting and design, the plant could enhance the general landform, vegetation and character of its immediate landscape.

Significant negative impacts are the plants proximity to unique historic and cultural sites, potential traffic problems during summer construction operations, general incompatibility with surrounding development, and potential visual dominance due to the site being located at the focal point of rather long, linear avenues of approach. However, most of these can be minimized, and proper design could turn the potential visual dominance into an asset. Overall, the site is acceptable for the construction of a wastewater treatment plant.

Ipswich: This primary treatment plant provides service for approximately 30 to 40 percent of the population. Effluent is discharged into the Ipswich River estuary. The plant is currently being expanded and upgraded to secondary treatment.

Significant positive impacts generated by the plant would be those associated with the discharge of better quality effluent; improved water oriented recreation, shell fishing, and maintenance of the environmentally significant saltwater marsh. However, before these impacts can be realized, discharges upstream along the Ipswich River and its tributaries must be improved.

The plant is located in a fairly dense grove of deciduous trees. The expansion and upgrading construction operation does not appear to require removal of this material. As such, the vegetation provides an excellent screen between the plant and nearby homes and marsh areas.

Lowell: Site preparation for the construction of this proposed facility has been completed. The work involved filling the Merrimack River to connect the Duck Islands to the existing river bank along Merrimack Avenue. The islands were covered by several feet of fill and their value as visual elements in the riverscape has been completely destroyed. The man-made site is highly visual in the river and this is accentuated by the proximity and general layout and alignment of Merrimack Avenue.

Construction of the plant is expected to start by summer, 1975. The plant will serve Lowell and Dracut

which are outside the BH-EMMA, plus Tewskbury and a portion of Chelmsford.

The plant does support general development proposals for the area and it will provide needed service to a relatively industrialized, densely populated region. The treated effluent should reinforce other regional proposals in which improvement of the water quality and visual appearance of the Merrimack River are major concerns.

The most significant negative impact, other than those associated with site preparation, is the plants visual dominance of this portion of the river. However, the site does offer the potential for direct access to the river and this opportunity should be a major consideration in the layout and design of the facility.

Lynn: This regional plant will serve Lynn, Saugus and Nahant. These communities have extensive municipal systems, all of which currently dump untreated wastewater into Lynn Harbor. Portions of the system in Lynn are combined sewers and this community also contributes a significant amount of industrial wastewater to the harbor.

The most significant positive impact generated by this facility would be the improved water quality in the harbor. Lynn harbor is one of the most polluted harbors on the coast. However, it has excellant potential for boating, sportfishing and shellfish harvesting, all of which are either currently limited, or impossible, because of the poor quality of the harbor's waters.

There are other sources of pollution that will have to be resolved before the harbor's potential can be realized. These are the industrial discharges from the General Electric plant into the Saugus River and the leachates from the landfill and incineration operations on the Saugus and Pines River Marshes.

The proposed plant will be a visual improvement in the general appearance of the area. It will be compatible with the type, density and scale of surrounding development and it will improve the character of the

area. A fishing pier and a small park have recently been constructed at the intersection of the harbor bulkhead and the mouth of the Saugus river. The design of the plant should include the extension of this band of recreation along the harbor bulkhead.

Overall, the site appears to be an excellent choice for the construction of a wastewater treatment facility.

Manchester: Manchester is the only Town in the north coastal drainage area that has secondary treatment for its wastes. The plant is located on a small backwater off the main harbor anchorage area. It is bordered by a Boston and Maine railbed, the Town Hall, Police and Fire Stations, the V.F.W. hall and a small parking lot. The site is somewhat enclosed and noise and faint odors from the plant are immediately apparent. The surrounding development is a mixture of construction materials, colors and textures and the plant blends in fairly well.

Potentially significant negative impacts related to future expansion of the plant are the plants dominance of the site and the conflict of existing land uses. Also, unlike the existing facility, the expanded plant should provide easy access to the waters edge.

Marlborough, East: This plant is a new, advanced waste treatment facility designed to handle an average flow of 5.5 mgd in 1990. Treated effluent is discharged into a tributary of the Sudbury River. The plant will treat wastewater from eastern Marlborough and Southborough under Concept One, but will remain a municipal facility (eastern Marlborough only) under the other four concepts.

Significant impacts related to the facility are the effects that the discharge of an improved quality effluent will have on the water quality and visual appearance of Hager Pond, Hop Brook and the Sudbury River.

The plant site is relatively flat with very little vegetation. It is rural in character and is surrounded by groves of pines and mixed deciduous trees. Plant expansion required by the various concepts should be

easily accommodated without penetrating this natural buffer. It is assumed that lawns will be established and that trees and shrubs will be planted when construction is completed. This will improve the overall appearance of the site. However, rather extensive areas of old lagoons from the original plant still exist on the site. They are a visual distration and their removal and subsequent regrading and seeding of the area would improve the continuity of the site.

Marlborough, West: This existing secondary treatment facility discharges fairly high quality effluent into the Assabet River. It is located on a small, flat, rather open site near the shoreline of Millham Reservoir. Surrounding land is heavily wooded and slopes away to the wetlands along the river. The reservoir and wetlands are significant open spaces and valuable environmental resources.

The plant is compatible with regional development plans for the area and the site appears to be of sufficient size to accommodate future expansion without penetrating the surrounding woods line or disturbing the adjacent marshes and open spaces.

Marshfield: This existing facility is located on the edge of a salt marsh adjacent to the Green Harbor River. Portions of the site are 3 to 4 feet above the mean elevation of the marsh. It is adjacent to the compact, relatively dense commercial and retail section of the Brant Rock summer colony area. The plant is very small and inconspiciously located, but it is in plain sight of the main street and surrounding development.

The concept proposal is for an upgraded secondary treatment facility occupying about 3.5 acres. It would treat flows from Marshfield and Norwell, after 2000.

Positive impacts generated by this proposal are those related to improved water quality due to reduced use of sub-surface septic systems. This is particularly important in this area as more and more summer homes are being converted to year-round use.

Negative aspects of the proposal involve the certain visual dominance of the upgraded and enlarged plant, and its incompatibility with the surrounding development. The plant's physical and visual intrusion into the ecologically fragile salt marsh could produce serious environmental and design impacts. The MAPC Open Space Plan designates this marsh as a Natural Environment Area. The plant is upwind of commercial and residential areas and odors are a potential problem.

Medfield: Medfield has an existing secondary treatment plant which serves a very limited area of the Town. Construction of a new, regional, advanced treatment facility is now underway. This new plant will treat sewage from all of Medfield and Millis, plus portions of Norfolk, after the year 2000.

The site for the new plant is a triangular shaped piece of land that projects into the Charles River Marsh. It is low in the center and surrounded by a railroad embankment and high ridges. There is adequate natural vegetation along most of these ridges.

Regional wastewater treatment concepts involving this plant are somewhat inconsistant with general development proposals for the area. Secondary visual impacts resulting from increased development and changes in groundwater recharge are potentially significant.

The plant would not conflict with surrounding development. The site appears large enough to accommodate required expansion within its natural buffers. Development of design plans for the plant's expansion might well consider the park potential of the high ground immediately southwest of the site.

Overall, the site seems suitable for the facility and its eventual expansion.

Medway: Approximately 10 percent of Medway is now sewered. Sewage is chlorinated and discharged into the Great Black Swamp.

Concept proposals suggest the construction of new, regional, advanced wastewater treatment plant. The suggested site is the north end of Populatic Pond.

There are many significant negative impacts generated by this proposal. The regional service potentially provided by this concept may produce growth and development inconsistant with general development plans for the area. The plant would be very visible and would completely dominate the local landscape. It would be incompatible with the type, density, character and scale of surrounding development and it could preclude some current recreational activities. The concept proposals indicate substantial flow increases by the year 2050, and it is questionable whether the site could accommodate the required expansion.

This site is not recommended for the construction of a wastewater treatment facility.

Middleton: This proposed facility is compatible with general development and densities in the area and it will provide a needed service to the somewhat "older" communities of Middleton and North Reading.

While the plant will be inconsistant with the type and character of the surrounding development, current zoning should control future problems associated with proximity, and careful design can minimize impacts with existing development. Careful siting and landscaping can improve the landform and general character of the site. The site plan should improve and encourage access to the river. This portion of the river is heavily fished, and provisions for parking for the fishermen should be considered.

This site is adequate for the construction of a wastewater treatment facility.

Nut Island: The Nut Island site consists of 17 acres on a low hill (the former Nut Island) and adjoining filled land connecting Hough's Neck to the original island. Though perhaps less visually significant to the Harbor than other, more strategically located islands, Nut Island is visible from surrounding areas in Quincy and Hingham Bays, and the adjacent Quincy Great Hill residential development.

The present primary treatment plant occupies about 7 of the site's 17 acres. The plant treats sewage from communities in the Southern MDC sewer district. The

plant has become the object of concern due to limited treatment and increasing loads.

The Concept One proposal requires approximately 53 acres of land to accommodate the upgraded and expanded facility. With only 5-10 acres available, this proposal will require either extensive harbor filling, acquisition of portions of adjoining residential lots, or the development of a complex, innovative multi-level plant.

Significant positive impacts generated by the concept proposal are those associated with improved water quality; generally water oriented active recreation. However, these positive impacts are subject to the same constraints and variables presented in the Deer Island discussion.

Potential negative impacts range from loss of housing and disruption of development to the environmental and ecological effects of filling on shallow water, tidal, marine life. Increased traffic is also a concern, particularly in the Hough's Neck area.

Design of the expanded facility should minimize filling, reduce the dominance of the plant and leave the periphery open for public access. The MAPC Open Space Plan designates this area as a Natural Environment Area, and while it is probably late for this, some potential can still be realized around the edges of the facility.

Rockland: The site of this existing secondary treatment facility is low land near the edge of the Beech Hill Swamp. The plant has a capacity of about 1 mgd, serves approximately 20 percent of Rockland, and it occupies 5 to 7 acres of land. It is somewhat isolated at the end of a long driveway and well screened by plant material. The only visible elements are two, rather attractive sludge digestors located at the focal point of the entrance drive.

Positive impacts of the plant are the improved water quality in French stream and the potential for developing a recreation area between the plant and the adjacent Esten Elementary School.

Potential negative impacts are the possible intrusion into wetlands during expansion, and the secondary impacts resulting from increased use of structured municipal systems. The extent, and to some degree the necessity of increased surface coverage required by expansion is somewhat unclear. At a capacity of 1 mgd, the present plant occupies 5 to 7 acres, yet the concept proposal indicates that a new facility of 1.7 mgd requires only 2.7 acres. The exact area need to increase the plant's capacity to design flows is unclear.

Rockport: Construction of this secondary treatment facility started in August, 1974. The plant is located at the end of a narrow residential road and it is adjacent to the Rockport Cemetery.

The plant provides a needed service to the area and it should improve the visual appearance and quality of both inland surface waters and ocean discharges. However, secondary impacts resulting from increased use of a structured municipal system could be very significant in this area.

The plant is incompatible with the type and character of the surrounding development. However, this impact can be minimized by the preservation of existing vegetative buffers around the site. Increased traffic, especially during the summer tourist season will be a problem. Most of this will be generated by the construction operation and, as such, it will be a temporary inconvenience.

Salem: This regional secondary treatment facility is under construction. It will treat sewage from Salem, Beverly, Danvers, Marblehead, and Peabody. Many of these communities are quite industrialized and heavily populated.

Positive impacts related to the plant are improved water quality and resultant increases in the intensity and types of water oriented recreation. The plant is compatible with adjacent development and does not dominate the site. Effective grading and planting would compliment the plant and it could become an attractive addition to the area. Provisions for access to the edge of the harbor along the north side of the site would allow more intensive use of this area. A

boat launching ramp and parking facilities for cars and trailers would be a desirable addition to the plant.

Scituate: This is an existing secondary treatment facility with a capacity of approximately 1 mgd. It is located on an 11 acre site near the edge of the North River Marsh. The site is surrounded by low woods meadow, brush, and marsh and is well screened from the Driftway by rolling terrain. While the plant itself is visible from the marsh to the south and a golf course which wraps around portions of the site, natural reeds screen most of the existing tanks. The most visual element is the top of the grit crane.

The concept proposals indicates that the facilities capacity will be increased to 5.5 mgd by 2000, 8.8 mgd by 2020, and 14 mgd by the year 2050. The facility will become regional and treat sewage from portions of Scituate, Marshfield and Hanson (outside the study area) and all of Hanover and Pembroke.

Significant positive impacts generated by the regional service are related to improved water quality and increased recreational opportunities. The plant should assist efforts to maintain the high water quality in the North River.

A potentially significant negative impact is the secondary effects generated by increased use of structured municipal systems. Another is the obvious problem of possible intrusion by the expanded facility into the North River Marsh. The marsh is a valuable and unique cultural and environmental resource. Recent DCA studies and the MAPC Open Space Plan recognize the unique values of the area and it has been proposed for a National Wildlife Preserve.

The design of the expanded facility should respect the dominant horizontal visual quality of the site. Tanks and structures should be kept low and perhaps screened by low berms planted with natural marsh grasses and reeds. However, if the expanded facility cannot be accommodated on the existing site and intrusion further into the marsh is inevitable, the selection of another site is recommended.

Sudbury: The site suggested for the construction of this proposed regional advanced wastewater treatment plant is a peninsula jutting into a State Fish and Game area. This reserve is an extensive marsh land next to the Sudbury River. The concept proposal indicates a plant capacity of 5.9 mgd and a site of approximately 6.6 acres. Flows are increased to 14 mgd by 2050, and it is assumed that site requirements are somewhat proportional. The plant will treat sewage from Sudbury and Wayland.

The only significant positive impacts generated by the construction of this plant are those associated with improved water quality.

Potentially significant negative impacts involve the proposed plants relationship to the State Fish and Game Area. The area is environmentally and culturally unique and offers recreational opportunities for large numbers of people. If the proposed plant and its projected expansion cannot be accommodated without intrusion into this area, the selection of another site is recommended. Potential conflicts with surrounding development are unlikely to be significant since the area is zoned as flood plain. Visual dominance of the area by the plant could be minimized by proper design and site planning.

With the exception of potential intrusion into the fish and game area, this site appears suitable for the construction of a wastewater treatment facility.

Swampscott: This small, existing primary treatment plant serves over 95 percent of the Town. It has been operational for only a few months, but has had the significant positive impact of improving coastal water qualities to the extent that the Town's principal beach was recently reopened for swimming.

The plant site fronts the major roadway between Swampscott and Marblehead, and the plant is visually dominant and out of scale and character with much of the surrounding development. The site backs up to some of the most desirable vacant residential property remaining in the Town, and the construction of homes, which appears imminent, will aggravate this problem.

CONCEPT: One IMPACT TOTALS	SITE SELECTION	DESIGN	CONSTRUCTION	OPERATION
REGION	% of Total: 2.2%	0%	0%	4.9%
PLANNING:				
Land Use; General	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(4)+(16)-(11)
Land Use; Specific	0(3)+( )-(11)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
SITE SPECIFIC	% of Total: 10%	1.5%	2.5%	3.2%
PLANNING:				
General Zoning	0(1)+(4)-(17)	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Land Use; Specific	0(3)+(4)-(4)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
Unique Historic Site	0( )+( )-(3)	0(2)+( )-( )	0( )+( )-(1)	0(4)+( )-( )
Unique Cultural Site	0(4)+( )-(17)	0(8)+( )-( )	0( )+( )-(4)	0(10)+( )-( )
Traffic Pattern	0( )+( )-(8)	0( )+( )-( )	0( )+( )-(11)	0(2)+( )-(4)
DEVELOPMENT:	% of Total: 10.9%	4.6%	0.8%	2.5%
Type	0(1)+(2)-(15)	0(5)+( )-( )	0( )+( )-( )	0( )+(1)-(6)
Density	0(2)+(2)-(9)	0(7)+( )-( )	0( )+( )-(4)	0( )+( )-( )
Character	0( )+(7)-(13)	0(9)+( )-( )	0( )+( )-(1)	0(3)+( )-(5)
Scale	0(5)+(2)-(13)	0(9)+( )-( )	0( )+( )-( )	0( )+( )-(1)
LANDSCAPE:	% of Total: 16.3%	8.5%	3.5%	4.6%
Landform	0(3)+(8)-(9)	0(14)+( )-( )	0( )+( )-(6)	0( )+( )-( )
Vegetation	0(3)+(4)-(14)	0(15)+( )-( )	0( )+( )-(6)	0( )+( )-(1)
Character	0(2)+(4)-(20)	0(12)+( )-( )	0( )+( )-(6)	0(6)+(1)-(2)
Unique Value	0(4)+(1)-(14)	0( )+( )-( )	0( )+( )-(3)	0(3)+(3)-( )
Access	0(6)+(8)-(6)	0(14)+( )-( )	0( )+( )-(2)	0(11)+(1)-(2)
ENVIRONMENT:	% of Total: 0%	0%	2.2%	21.9%
Water Clarity	0( )+( )-( )	0( )+( )-( )	0( )+( )-(2)	0(12)+(14)-( )
Water Color	0( )+( )-( )	0( )+( )-( )	0( )+( )-(4)	0(13)+(11)-( )
Water Quantity	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(11)+( )-(19)
Water Quality	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)	0( )+(31)-( )
Air Quality	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Noise Level	0( )+( )-( )	0( )+( )-( )	0( )+( )-(6)	0(9)+( )-(1)
Odor	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(18)+(2)-(2)
Vibration	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
TOTALS:	37 46 173	95 0 0	1 0 57	108 80 54
TOTALS: (%)	39.4%	14.6%	9.0%	37.1%

Odor and noise are readily detectable, and plant expansion and upgrading may compound these impacts.

Findings; Concept Two: Concept two reduces the service area tributary to the Deer and Nut Island treatment plants. The reduced area is served by 5 new regional treatment systems. The service area of the Marlborough East plant, a regional facility under Concept One, is reduced and the plant is considered a municipal facility under this concept. All other plants and facilities contained in Concept One remain the same and are common to Concept Two.

The 36 individual plant/facility sites in Concept Two generate a total of 779 impacts for an average of 21.6 impacts per site. Compared to Concept One, Concept Two has a 16.1 percent increase in total plant/facility sites, a 19.7 percent increase in total impacts, but only a 2.9 percent increase in the average number of impacts per site.

The reduction of the Metropolitan Sewerage District proposed by this concept has more impact on Nut Island than it does on Deer Island. Concept Two would reduce the flows and area requirements for Nut Island projected under Concept One by 48.6 and 34.0 percent, respectively. Similar reductions at Deer Island are only 9.2 and 6.1 percent, respectively. However, this still represents a three fold increase in the area of the current Nut Island facility and the impacts of this plant, as well as those pertaining to Deer Island, are expected to remain very similar to those outlined and discussed under Concept One.

Canton; North: This proposed regional advanced wastewater treatment facility will treat flows from Westwood and portions of Canton, Dedham and Norwood. The concept proposal indicates a projected flow of 5.5 mgd on a 6.3 acre site in the year 2000. Flows are shown increasing to 8.0 and 8.2 mgd by 2020 and 2050 respectively.

The proposed site is near the Neponset River and the Fowl Meadow Reservation. This is close to the boundaries of Milton, Dedham and Boston. The exact location of the suggested site is somewhat unclear.

Early concept maps indicated that the plant was actually in the Fowl Meadow Reservation, apparently astride a junction in the existing Neponset interceptors. Later maps moved the site to the north and west, apparently onto a landfill area adjacent to existing industrial development. While the move is significant with respect to the magnitude of the facilities impacts on the Fowl Meadow Reservation, the plant's proximity to the marsh is still a critical concern.

Significant positive impacts generated by the facility include increased stream flow in the Neponset River and a reduction in the volume of discharge at the Nut Island plant. If properly designed the plant could provide increased access to the river and marsh area. However, the desirability and extent of this access should reflect careful review of the areas ability to withstand and absorb probable impacts resulting from increased accessability.

The Fowl Meadow Reservation is proposed as a new or continuing Natural Environmental Area in the MAPC Open Space Plan, and protection of the area was a main reason for the recent halt in the extension of Route 95. The potential intrusion of the plant into the marsh, and the visual dominance it may have on the area, are major concerns. Also, negative impacts associated with a major construction operation are potentially significant. A recommendation as to the suitability of this site for the construction of a wastewater treatment facility is entirely dependent upon both the successful resolution of these significant problems and the results of a detailed ecological study of the area. If these issues can be resolved, the site is marginally acceptable for construction of the facility.

South Canton: The suggested site for this proposed regional advanced wastewater treatment plant is an area of filled industrial land on the edge of the Neponset River marsh. The site is bounded by Route 95 on the west, Neponset River to the south, low, residentially developed hills to the east and the marshes to the north. These marshes run north, south and extend on both sides of Neponset Street and the East Branch of the Neponset River. Six to eight acres of

the site are now being used as truck terminals and construction stock yards. The visual appearance of these uses is rather run-down. The site also straddles the junction of the existing Canton, Norwood and Neponset River interceptors.

The concept proposal proposes future flows of 25 mgd (2000), 30 mgd (2020) and 32 mgd (2050). The plant would serve Sharon, Stoughton, Walpole and portions of Canton and Norwood. 2000 projections indicate a required site size of 21 acres.

The plants proposed service region is currently tributary to Nut Island. As such, the facility will have positive impacts related to reduced effluent discharges, as well as those associated with increased discharges of high quality effluent into inland marshes and rivers. The plant is also relatively consistant with regional development proposals in that most of its service area is in the MAPC's southwest corridor of relatively high density development. Compatibility with surrounding development does not appear to be a significant problem and the plant could be an interesting visual experience from Route 95.

Negative impacts are those related to the potential destruction of 15 to 20 acres of marsh. MAPC's Open Space Plan indicates preservation of these marshes for Natural Environmental Areas. Wetlands legislation will most certainly be involved in project development.

In all, the suggested site is unacceptable from the standpoint of visual-cultural and design impacts. There appears to be, however, several high ground sites of the required acreage in the general vicinity. These should be investigated as potential alternatives.

Dedham: The construction of this regional advanced wastewater treatment facility will result in the reduction of effluent discharges into Boston Harbor as well as other visual improvements related to increased flows in the Charles River. Potential impacts relative to incompatibility or visual dominance of surrounding development and landscape features appear resolvable by careful siting and landscape treatment. The proposed site is an existing dump and its use avoids the poten-

tial destruction of river marsh areas. This is one of the few proposed plants that has any real degree of spatial separation between itself and its discharge point.

The plant will serve Wellesley, Natick, Needham and portions of Brookline, Dedham, Newton and Boston. Flows from Sherbon and Dover will be treated after 2000. Flows projections indicate 29 mgd (2000), 32 mgd (2020) and 33 mgd (2050). Site area required is 24 acres.

Potential negative impacts relate to the size of the site. This will require a compact design solution which must address the plants relationship to Mother Brook and Center Street. Attractive pedestrian access to the brook is a design consideration that should not be overlooked.

Framingham: This regional advanced treatment facility will receive flows from Ashland, Framingham, Hopkinton and Southborough. Flows from Southborough were treated at the Marlborough East plant in Concept One, but that plant becomes a municipal facility in both this and the other remaining concepts. Project data indicates flows of 19 mgd and a site requirement of 17 acres by the year 2000. Flows are projected to 23 and 27 mgd by 2020 and 2050.

The proposed site is located between an MDC aqueduct, the Pod Meadow and an oxbow in the Sudbury River. It is open, flat and entirely void of vegetation. However, bands of trees do exist around the perimeters of the sight, especially along the river and the adjacent marshes. The site has two distinct levels. Southwestern portions of the site are 20 to 30 feet higher than northeastern portions, which are close to river bank grade. The most dominant visual impression from the site is the results of active (southwest area) and inactive gravel removal operations.

Significant positive impacts of this proposal are the reduction of flows in Boston Harbor (Nut Island) and the visual impacts resulting from increased flows of better quality water in the Sudbury River. Additional positive impacts could be realized if the plant was designed to provide an open space and recreational

linkage between the river, Pod Meadow and Lake Cochituate State Park to the east. Enhancement of a potential linear open space corridor along the MDC aqueduct is another possibility that should be investigated. The site plan should also reflect a connection between the plant and existing perimeter vegetation.

Potential negative impacts of the proposal relate to the questionable ability of the site to accommodate projected expansion without penetrating the perimeter vegetation and/or intruding into the river oxbow and Pod Meadow marshes. If expansion can be contained within the sites natural definitives, the site is suitable for the construction of a wastewater treatment facility.

Watertown: This suggested site is defined by Coolidge Avenue, Greenough Boulevard and Arsenal Street. It is close to the Charles River and has a fairly rural character despite its urban setting. More than one half of the site is a flat, semi-wetland area. There is a significant grade change of approximately 30 feet in one area of the site, and it appears to be the result of a former landfill operation. The site is adjacent to what is becoming a major redevelopment area involving the Arsenal and the former B.F. Goodrich property. General Services Administration facilities occupy portions of the site. Surrounding development is generally retail and commercial, with the exception of a tennis club which is under construction. Sawins Pond and the river are significant natural and open space features.

The proposed facility will serve Lincoln, Watertown, Waltham, Weston and parts of Newton. Projected flows are 45 mgd and 34 acres is the suggested site size.

Significant positive impacts are reduced flows into the Boston Harbor treatment plants and resultant reductions in their discharges, and the visual impacts of increased flows of better quality water in the Charles River. If the plant could be designed to preserve and enhance the open space potential along the river, and possible link this together with Sawins Pond, other benefits could be realized.

CONCEPT: Two IMPACT TOTALS	SITE SELECTION	DESIGN	CONSTRUCTION	OPERATION
REGION PLANNING:	% of Total: 2.3%	0%	0%	4.7%
Land Use; General	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(7)+(18)-(11)
Land Use; Specific	0(4)+( )-(14)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
SITE SPECIFIC PLANNING:	% of Total: 10.1%	1.7%	2.2%	2.7%
General Zoning	0(1)+(6)-(20)	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Land Use; Specific	0(4)+(4)-(5)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
Unique Historic Site	0(1)+( )-(3)	0(3)+( )-( )	0( )+( )-(1)	0(4)+( )-( )
Unique Cultural Site	0(5)+( )-(21)	0(10)+( )-( )	0( )+( )-(5)	0(10)+( )-( )
Traffic Pattern	0( )+( )-(8)	0( )+( )-( )	0( )+( )-(11)	0(2)+( )-(4)
DEVELOPMENT:	% of Total: 10.8%	4.7%	0.6%	2.3%
Type	0(2)+(2)-(18)	0(7)+( )-( )	0( )+( )-( )	0(1)+(1)-(7)
Density	0(3)+(2)-(10)	0(8)+( )-( )	0( )+( )-(4)	0( )+( )-( )
Character	0(1)+(8)-(15)	0(11)+( )-( )	0( )+( )-(1)	0(3)+( )-(5)
Scale	0(6)+(2)-(15)	0(11)+( )-( )	0( )+( )-( )	0( )+( )-(1)
LANDSCAPE:	% of Total: 16.4%	9.0%	3.9%	4.5%
Landform	0(4)+(11)-(9)	0(17)+( )-( )	0( )+( )-(7)	0( )+( )-( )
Vegetation	0(4)+(6)-(16)	0(19)+( )-( )	0( )+( )-(9)	0( )+( )-(1)
Character	0(2)+(4)-(25)	0(16)+( )-( )	0( )+( )-(8)	0(8)+(1)-(2)
Unique Value	0(5)+(1)-(17)	0( )+( )-( )	0( )+( )-(3)	0(3)+(3)-( )
Access	0(6)+(12)-(6)	0(18)+( )-( )	0( )+( )-(3)	0(14)+(1)-(2)
ENVIRONMENT:	% of Total: 0%	0%	2.4%	21.6%
Water Clarity	0( )+( )-( )	0( )+( )-( )	0( )+( )-(3)	0(12)+(19)-( )
Water Color	0( )+( )-( )	0( )+( )-( )	0( )+( )-(5)	0(14)+(15)-( )
Water Quantity	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(12)+( )-(22)
Water Quality	0( )+( )-( )	0( )+( )-( )	0(2)+( )-(2)	0( )+(36)-( )
Air Quality	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Noise Level	0( )+( )-( )	0( )+( )-( )	0( )+( )-(6)	0(10)+( )-(1)
Odor	0( )+( )-( )	0( )+( )-( )	0( )+( )-(1)	0(23)+(2)-(2)
Vibration	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
TOTALS:	48 59 202	120 0 0	2 0 69	125 96 58
TOTALS (%)	39.6%	15.4%	9.1%	35.8%

Negative impacts of this proposal are the plants incompatibility with surrounding development in that it will dominate and compete with existing and proposed land uses, and the visual dominance that it might impose over the entire area. However, the most important impacts relates to the size of the site. It appears that the site can only accommodate the plant if the design evolves into a very compact, verticle structure and treatment process. Other obvious problems aside, this would only aggravate the previously discussed impacts.

This site is not recommended for the construction of a wastewater treatment plant.

Concept Three: This concept expands the service area of the Metropolitan Sewerage District. The expanded system serves all communities that are naturally tributary to the existing system. Compared to Concept One, Concept Three does not change the Deer Island service area, but does add 9 communities which are tributary to Nut Island. This represents an increase of 36.0 percent in the Nut Island service area. Total flows to the Nut Island plant increase by 11.4 percent. These figures include "post 2000" communities.

The expanded Metropolitan Sewerage District eliminates the regional facilities at Medfield and Medway as well as the municipal plant in Hopedale. Also, the Marlborough East plant serves as a municipal facility as it does under Concept Two. All other communities in the study area are served as detailed in Concept One.

Concept Three is composed of 28 individual plant/facility sites. Twenty-three of these facilities are either existing, under construction, or in some phase of implementation. The 28 plants generate a total of 579 impacts for an average of 20.7 impacts per site. Compared to Concept One, Concept Three has 9.7 percent fewer sites, 11.1 percent fewer total impacts, but only a 1.4 percent reduction in the average number of impacts per site.

The most significant impacts related to Concept Three are those associated with the increased flows into Boston Harbor, the filling of the waters around the Nut Island plant (the area required by this concept

CONCEPT: Three IMPACT TOTALS	SITE SELECTION	DESIGN	CONSTRUCTION	OPERATION
REGION	% OF TOTAL: 1.9%	0%	0%	5.0%
PLANNING:				
Land Use; General	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(4)+(15)-(9)
Land Use: Specific	0(3)+( )-(8)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
SITE SPECIFIC	% OF TOTAL: 10.5%	1.6%	2.8%	3.5%
PLANNING:				
General Zoning	0(1)+(4)-(16)	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Land Use; Specific	0(3)+(4)-(4)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
Unique Historic Site	0( )+( )-(3)	0(2)+( )-( )	0( )+( )-(1)	0(4)+( )-( )
Unique Cultural Site	0(4)+( )-(14)	0(7)+( )-( )	0( )+( )-(4)	0(9)+( )-( )
Traffic Pattern	0( )+( )-(8)	0( )+( )-( )	0( )+( )-(11)	0(2)+( )-(4)
DEVELOPMENT:	% OF TOTAL: 11.0%	4.3%	0.9%	2.4%
Type	0(1)+(2)-(14)	0(5)+( )-( )	0( )+( )-( )	0( )+(1)-(5)
Density	0(2)+(2)-(7)	0(5)+( )-( )	0( )+( )-(4)	0( )+( )-( )
Character	0( )+(6)-(12)	0(8)+( )-( )	0( )+( )-(1)	0(3)+( )-(4)
Scale	0(5)+(2)-(11)	0(7)+( )-( )	0( )+( )-( )	0( )+( )-(1)
LANDSCAPE:	% OF TOTAL: 15.9%	8.4%	3.5%	4.1%
Landform	0(2)+(6)-(9)	0(12)+( )-( )	0( )+( )-(5)	0( )+( )-( )
Vegetation	0(1)+(4)-(13)	0(14)+( )-( )	0( )+( )-(6)	0( )+( )-(1)
Character	0(1)+(4)-(18)	0(11)+( )-( )	0( )+( )-(5)	0(4)+(1)-(1)
Unique Value	0(4)+(1)-(11)	0( )+( )-( )	0( )+( )-(2)	0(2)+(3)-( )
Access	0(6)+(6)-(6)	0(12)+( )-( )	0( )+( )-(2)	0(9)+(1)-(2)
ENVIRONMENT:	% OF TOTAL: 0%	0%	1.9%	22.3%
Water Clarity	0( )+( )-( )	0( )+( )-( )	0( )+( )-(2)	0(11)+(12)-( )
Water Color	0( )+( )-( )	0( )+( )-( )	0( )+( )-(2)	0(12)+(10)-( )
Water Quantity	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(10)+( )-(17)
Water Quality	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)	0( )+(28)-( )
Air Quality	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Noise Level	0( )+( )-( )	0( )+( )-( )	0( )+( )-(5)	0(9)+( )-(1)
Odor	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(16)+(1)-(2)
Vibration	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
TOTALS:	33 41 154	83 0 0	1 0 51	97 72 47
TOTALS: (%)	39.3%	14.3%	9.1%	37.3%

is almost 6 times the current area of the site) and the loss of stream flows and related percolation. Available data* on average stream flows for the Charles River states an average flow of 296 cfs at Charles River Village. Combined flows from the Hopedale, Medfield and Medway plants is about 25 cfs (year 2000). Since most of this is much further upstream from Charles River Village, these plants could be expected to add more than 10 percent to total river flows in the upper runs of the river.

Concept Four: Concept Four reduces the size of the Metropolitan Sewerage District to 24 communities. This is 19 less than its current service area and 26 less than the proposed Concept One service area. These figures include both "in part" and "post 2000" communities. Compared to Concept One, this reduced or "decentralized" service area would contribute 25 percent less flow to Deer Island and 43 percent less flow to Nut Island. Service for remaining communities in the study area will be provided as in Concept One with the following additions; the regional facilities at Dedham (service area slightly revised), Framingham and Watertown, as described in Concept Two, and new regional facilities at Canton (95/128), Medford and Woburn.

The 37 plant/facility sites in Concept Four generate 810 impacts for an average of 21.7 impacts per site. Compared to Concept One, Concept Four has a 19.4 percent increase in sites, a 24.4 percent increase in total impacts, and a 3.3 percent in the average number of impacts per site.

Canton; 95/128: This proposed regional advanced wastewater treatment plant will treat flows from Canton, Westwood, Norwood, Sharon, Stoughton, and Walpole. The concept proposals project flows of 30 mgd by the year 2000 and indicate that the size of the required site is 25 acres.

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*"Water Resources Data for Massachusetts, New Hampshire, Rhode Island and Vermont, 1972;" U.S. Department of the Interior

The proposed site is similar to the other Canton sites (North, South in Concept Two) in that it is also on the Neponset River marshes. It appears to be located just southwest of the Route 95, 128 interchange and it is bounded by these highways, railroad tracks and an industrial park, and open marshes to the south. The Neponset River runs north, south thru the site and the Fowl Meadow, Neponset River Reservation is just north of the site, on the east side of Route 128.

Significant positive impacts generated by this facility include increased stream flows in the Neponset River and a reduction of both the expanded land area and discharge volumes of the Boston Harbor treatment facilities (the benefits of increased stream flows in the Neponset River may be slightly less than those generated by the South Canton plant since this facility is somewhat further downstream). Also, the plant may be visually beneficial in helping to reinforce the "industrial appearance" of the area.

Significant negative impacts deal mainly with the plants intrusion into a large marsh area. The area is both visually and ecologically valuable. It is one of the MAPC's proposed Natural Environment Areas. The Neponset River is rather serpentine through the site and would have to be rechanneled to accommodate the indicated plant acreage.

This site is not recommended for the construction of a wastewater treatment facility. However, an alternate site that appears somewhat more viable is an area of slightly higher ground about 4000 feet upstream.

Medford: The Medford site requires 25 acres for a 30 mgd plant to serve Arlington, Bedford, Lexington, and parts of Belmont, Medford, and Winchester. The only open land in the indicated general location is MDC parkland along the north bank of the Mystic River about 2000 feet south of Alewife Brook. The largest portion of this is a long (about 2000'), relatively narrow (200'-400'), strip of level park land, ballfields, and river edge totaling about 20 acres. It appears to be one of the most spacious and usable segments of the river edge and is assumed to remain a "Moderate Use Area" in the MAPC Open Space Plan.

Positive impacts generated by the facility include a reduction in both effluent flows and expansion area requirements of the Boston Harbor plants, and increased flows of better quality water in the Mystic River.

Negative impacts would include the loss of parkland, and the destruction of any river views from the adjacent road.

The proposed plant is clearly incompatible with the present appearance and use of the site. Consideration should be given to acquiring a site back from the river, or to replacing the open space by decking over the treatment plant, or building it underground.

Woburn: The Woburn site lies between the Aberjona River, and Rt. 93 just north of the Winchester line. It includes lowlands sloping up from the River's marshes, a gravel pit, and high ground rising 60' over an estimated 30% slope. It is bounded by housing a few hundred feet to the south, and industry 500 feet to the north. The marshland along the river is a proposed "Natural Environment Area" in the MAPC Open Space Plan.

A 31 mgd plant requiring 25 acres is proposed for the site. It is to serve Burlington, Reading, Wilmington, Woburn and parts of Stoneham, Wakefield, and Winchester. To avoid the marsh the plant would have to be built on the hillside with much landscape alteration, and increased development and operating costs.

Positive impacts include improved water quality in the Harbor, and increased and stabilized flows in the Aberjona River. The site is sufficiently altered and poorly vegetated now that further changes may have no more than a neutral or slightly negative impacts on landscape character. Other negative impacts are the short run neighborhood disruption from construction, possible intrusion on the marsh, and visual incompatibility with adjoining housing. The last may be minimized by the fact that the essentially flat plant elements will be at a slightly higher elevation than most of the housing. Odor impacts may also be minimal since the plant is slightly east (i.e. downwind) of the nearest housing.

CONCEPT: Four IMPACT TOTALS	SITE SELECTION	DESIGN	CONSTRUCTION	OPERATION
REGION	% OF TOTAL: 2.3%	0%	0%	4.7%
PLANNING:				
Land Use; General	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(7)+(19)-(11)
Land Use; Specific	0(5)+( )-(14)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
SITE SPECIFIC	% OF TOTAL: 10.0%	1.7%	2.1%	2.7%
PLANNING:				
General Zoning	0(1)+(7)-(19)	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Land Use; Specific	0(4)+(4)-(6)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)
Unique Historic Site	0(2)+( )-(3)	0(3)+( )-( )	0( )+( )-(1)	0(4)+( )-( )
Unique Cultural Site	0(5)+( )-(22)	0(11)+( )-( )	0( )+( )-(5)	0(11)+( )-(1)
Traffic Pattern	0( )+( )-(8)	0( )+( )-( )	0( )+( )-(11)	0(2)+( )-(4)
DEVELOPMENT:	% OF TOTAL: 11.1%	5.3%	1.0%	2.5%
Type	0(1)+(3)-(19)	0(7)+( )-( )	0( )+( )-( )	0( )+(1)-(8)
Density	0(3)+(3)-(11)	0(10)+( )-( )	0( )+( )-(1)	0( )+( )-(1)
Character	0(1)+(9)-(15)	0(12)+( )-( )	0( )+( )-(5)	0(3)+( )-(5)
Scale	0(6)+(3)-(16)	0(13)+( )-( )	0( )+( )-(2)	0(1)+( )-(1)
LANDSCAPE:	% OF TOTAL: 16.3%	8.9%	3.9%	4.7%
Landform	0(3)+(11)-(11)	0(19)+( )-( )	0( )+( )-(10)	0( )+( )-( )
Vegetation	0(4)+(5)-(17)	0(19)+( )-( )	0( )+( )-(9)	0(1)+( )-(1)
Character	0(2)+(4)-(26)	0(16)+( )-( )	0( )+( )-(7)	0(9)+(1)-(2)
Unique Value	0(5)+(1)-(18)	0( )+( )-( )	0( )+( )-(3)	0(3)+(3)-( )
Access	0(7)+(11)-(7)	0(18)+( )-( )	0( )+( )-(2)	0(15)+(1)-(2)
ENVIRONMENT:	% OF TOTAL: 0%	0%	1.7%	21.1%
Water Clarity	0( )+( )-( )	0( )+( )-( )	0( )+( )-(2)	0(13)+(18)-( )
Water Color	0( )+( )-( )	0( )+( )-( )	0( )+( )-(4)	0(14)+(15)-( )
Water Quantity	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(13)+(1)-(21)
Water Quality	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)	0( )+(37)-( )
Air Quality	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Noise Level	0( )+( )-( )	0( )+( )-( )	0( )+( )-(6)	0(11)+( )-(1)
Odor	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(23)+(2)-(2)
Vibration	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
TOTALS:	49 61 212	128 0 0	1 0 68	132 98 61
	39.7%	15.9%	8.7%	35.7%

In all, the location can be acceptable if the siting and landscaping of the plant sensatively protects the marsh, and screens the houses. The site has the advantage (like the Dedham site) of keeping the plant some distance from the receiving river.

Concept Five: Concept Five combines spray irrigation and rapid infiltration in an integrated regional system that provides advanced treatment for flows from the communities tributary to the Framingham, Woburn, Medfield, Watertown, Dedham and Canton (95/128) plants as detailed in Concept Four. Under Concept Four, these 6 plants provided advanced wastewater treatment. Their treatment changes to secondary in Concept Five. The concept proposes to connect the Woburn to Canton plants with a mole tunnel. Flows from the Framingham plant would travel to Canton thru existing MDC interceptors. From the Canton plant, all flows travel by surface force mains to spray irrigation and rapid infiltration sites located outside the BH-EMMA. Communities not served by Framingham and the 5 Woburn to Canton plants are served as proposed in Concept Four.

Concept Five is composed of 41 individual plant/facility sites. They produce 888 total impacts for an average of 21.7 impacts per site. Compared to Concept One this represents a 32.3 percent increase in total sites, a 35.2 percent increase in total impacts, and a 3.3 percent increase in the average number of impacts per site.

Bourne; East: This site consists of 2,745 acres in the former Otis Air Force Base. The land is a rolling, relatively level plateau about 200' high and is covered with a mixture of low pines and hardwoods. It is used as an artillery firing range and is well isolated by other vacant land on the military reservation. The nearest development is low density housing on Snake Pond a half mile to the Southeast, and developed portions of the base are about a mile to the south.

The site is the heart of the land application concept since its extensive areas of coarse sandy soils should be able to handle 168.0 mgd on essentially a year-round basis. Thus, it could process the bulk of the 177 mgd projected for the major satellite treatment

plants (Woburn to Canton plus Framingham) in 2000. This capacity will allow for both growth and needed resting of the spray irrigation sites. In addition to rapid infiltration lagoons, the concept calls for a 1,210 acre storage lagoon allowing 14 days of effluent storage during freezing weather. This backup feature may never be needed since rapid infiltration systems are reportedly undisturbed by freezing weather.

Positive impacts associated with this site are those associated with the creation of fairly large "ponds" in a particularly dry area of the Cape, increased groundwater levels in the area, the reduction of total site area requirements for the six "satellite" plants and the Boston Harbor facilities, and the projected changes in the growth rates of existing vegetation, though the latter applies more to spray irrigation.

Potential negative impacts include the possibility of damage to large areas of existing vegetation due to either system malfunction or reaction to effluent additives, groundwater degradation, and the commitment of large areas of potentially useable (recreation) and developable land.

Bourne; West: The Bourne west rapid infiltration site consists of 2 pieces of land, one containing 335 acres and the other 30 acres. They are located just north of the Cape Cod Canal and east of the village of Buzzard's Bay. It is hilly ground sloping to the north and west from about 150' to about 40', and is covered with low, mixed hardwoods and softwoods. Surrounding development includes town and federal open space to the south along the canal, a small parcel of state land containing Fish and Game offices to the north along Bournedale Rd., and commercial development to the west at the end of the Bourne Bridge.

The proposed rapid infiltration facility would have a capacity of 19.7 mgd, and like the others, would serve the major "satellite" plants. It will supplement the 168 mgd Bourne East site on Otis Air Force Base across the canal.

Significant impacts related to this site, both positive and negative, are identical to those described for the Bourne East site. In addition, consideration

should be given to the impacts from the proposed extension of Route 25.

Freetown; Fall River Spray Irrigation Site: This site consists of 6,920 acres of low hills and ridges interspersed with wetlands. The largest group of sub-sites is clustered around Copicut Hill in Fall River. It includes the southern edge of the Fall River - Freetown State Forest and the eastern edge of the Watuppa Reservation, but is mostly on private undeveloped land. Two major sub-sites border the new Copicut Reservoir. The second group of sub-sites consists of 2 drumlins and nearby slopes centered on the Lakeville - Freetown boundary. One of these hills abutts the only major cranberry bog in the area. The third cluster of sub-sites is a group of hillsides on either side of the Freetown - Berkly border. This includes Brecksneck Hill in the northern top of the Fall River - Freetown State Forest.

The total site is planned to have a capacity of 23.4 mgd and to serve the same group of major satellite plants as the other land application sites. Much of the proposed area may be needed for the required 526 acres of storage lagoons. No specific sites are shown. Use of the most centrally located vacant area on high ground, the land on both sides of Makepeace Rd. in the Fall River - Freetown State Forest, would remove a large portion of the forest's limited relatively level upland. Use of swamp area would presumbably increase pumping costs, and remove ecologically valuable swamp.

Positive impacts include improvement of Boston Harbor water quality, reduction in satellite and harbor plant site requirements, and a slight expansion in publically controlled open land.

Negative impacts include reduction in the recreation usefulness of the State Forest, and its wildlife sanctuary function, possible visual inappropriatness if a large clearly man-made storage lagoon in the forest, withdrawal of high, relatively attrative hill tops from the housing market, and unknown effects on one major cranberry bog.

Use of this site does seem compatible with the expansion of public open space and low density residential uses encouraged as expected by the Southeastern

Regional Planning and Economic Development Commission staff. There appears to be few plans for expanded recreational facilities in the State Forest. The crucial regional planning concern is protection of water supplies and cranberry bogs. Other issues are the lack of local benefits (e.g. use of the system for local sewage disposal), and an unclear institutional structure. The public health and governmental question are the subjects of other studies, and possible local tie-ins should be explored. In all, the site does seem generally acceptable from a visual standpoint, and should be studied further.

Lakeville - Freetown; Proposed Infiltration Site: This site consists of 2 sub-sites, one of 96 acres and one of 111 acres on either side of the railroad tracks at Lakeville - Freetown line. The land slopes gently from about 150' to swamp land at about 90'. It is covered with mixed hard and soft woods, and a few open fields. The surrounding area is undeveloped, except for a regional high school immediately north of the large site. The open hillside North, South, and West of this smaller site are all in the proposed Freetown - Fall River spray irrigation site.

The proposed facility would handle up to 11.4 mgd and would serve the same group of major satellite plants as the other land application sites. It appears to have good pipeline access, since the railroad bisecting it crosses a pipeline which in turn crosses Rt. 24. The concept also calls for a 139 acre storage lagoon, along with a 526 acre lagoon for the adjoining spray irrigation site. It is fortunate that the lagoon may be optional (given the reported year-round useability of R.I. sites), since there are few potential storage areas.

The Southeastern Mass. Regional Planning agency expects little local development due to poor access, lack of utilities, and slow sub-regional growth. Thus the site is compatible with local and regional planning concerns, so long as nearby surface water supplies are not harmed.

Major positive impacts include improved Boston Harbor water quality, and reduced harbor and regional plant site requirements.

Negative impacts include removal or relocation of minor streams draining the larger site, and removal of an apparently much used woodland and potential school expansion area south of the regional high school.

In all, the site seems basically acceptable due to its compactness and isolation. The main concern is that it does not conflict with the neighboring Apponequet Regional High School. This seems unlikely, due to the large school site and intervening playing fields and woodlands.

Plymouth/Carver: In total, this group of sites represent the largest areas designated for spray irrigation. A total of 8,086 acres are spread over a fairly broad area in 11 individual sub-sites. Most of the acreage is in the Myles Standish State Forest in Plymouth. In addition to this area, there is another 1,012 acres in the Carver portions of the Forest, 778 acres in Wareham (316 acres west of Red Brook and 461 acres south of the Forest) and about 377 acres in Bourne, north of the Cape Cod Canel. These sub-sites generally occupy low, rolling woodlands. Existing vegetation is mainly low pines and mixed hardwoods. Much of the area is burnt over forest. There are many ponds in the area, as well as 8 or 9 cranberry bogs near some of the sites.

The complete site would be able to handle 29.5 mgd. This includes some reserve capacity since the total land application concept provides 252 mgd capacity to meet a 177 mgd demand projected for 2000. Approximately 675 acres of the spray site will be used for storage lagoons. The lagoon locations are undefined, but presumably would be central to the whole cluster of sub-sites, and relatively high. Thus, one possibility would be the high ground along the eastern boundary of the Forest, just west of Halfway Pond.

Potential positive impacts resulting from the use of these sites as spray irrigation facilities are similar to those outlined in Bourne East, plus an increase in publically controlled land.

Potential negative impacts resulting from the use of these sites for spray irrigation are also similar to

CONCEPT: FIVE IMPACT TOTALS	SITE SELECTION	DESIGN	CONSTRUCTION	OPERATION
REGION PLANNING:	% of Total: 2.7%	%	%	4.7%
Land Use; General	0( )+(1)-( )	0( )+( )-( )	0( )+( )-( )	0(7)+(23)-(11)
Land Use; Specific	0(8)+(1)-(14)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-( )
SITE SPECIFIC PLANNING:	% of Total: 9.1%	1.6%	1.9%	2.8%
General Zoning	0(1)+(6)-(19)	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
Land Use; Specific	0(4)+(5)-(6)	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)
Unique Historic Site	0(2)+( )-(3)	0(3)+( )-( )	0( )+( )-(1)	0(4)+( )-( )
Unique Cultural Site	0(5)+( )-(22)	0(11)+( )-( )	0( )+( )-(5)	0(12)+( )-(1)
Traffic Pattern	0( )+( )-(8)	0( )+( )-( )	0( )+( )-(11)	0(2)+( )-(4)
DEVELOPMENT:	% of Total: 10.2%	4.6%	1.0%	2.8%
Type	0(2)+(3)-(18)	0(7)+( )-( )	0( )+( )-( )	0(2)+(1)-(8)
Density	0(3)+(3)-(10)	0(9)+( )-( )	0( )+( )-(1)	0( )+( )-(1)
Character	0(2)+(9)-(16)	0(13)+( )-( )	0( )+( )-(6)	0(6)+( )-(5)
Scale	0(6)+(3)-(15)	0(12)+( )-( )	0( )+( )-(2)	0(1)+( )-(1)
LANDSCAPE:	% of Total: 16.2%	9.6%	4.4%	5.9%
Landform	0(4)+(10)-(15)	0(22)+( )-( )	0( )+( )-(14)	0(4)+( )-( )
Vegetation	0(3)+(6)-(19)	0(23)+( )-( )	0( )+( )-(13)	0(4)+(1)-(1)
Character	0(2)+(5)-(27)	0(18)+( )-( )	0( )+( )-(7)	0(10)+(1)-(2)
Unique Value	0(5)+(1)-(18)	0( )+( )-( )	0( )+( )-(3)	0(4)+(3)-( )
Access	0(7)+(15)-(7)	0(22)+( )-( )	0( )+( )-(2)	0(19)+(1)-(2)
ENVIRONMENT:	% of Total: 0%	0%	1.6%	20.9%
Water Clarity	0( )+( )-( )	0( )+( )-( )	0( )+( )-(2)	0(13)+(17)-( )
Water Color	0( )+( )-( )	0( )+( )-( )	0( )+( )-(4)	0(14)+(14)-( )
Water Quantity	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(13)+(6)-(20)
Water Quality	0( )+( )-( )	0( )+( )-( )	0(1)+( )-(1)	0( )+(41)-( )
Air Quality	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(5)+( )-( )
Noise Level	0( )+( )-( )	0( )+( )-( )	0( )+( )-(6)	0(11)+( )-(1)
Odor	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0(27)+(2)-(2)
Vibration	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )	0( )+( )-( )
TOTALS:	54 68 217	140 0 0	1 78	160 110 60
TOTALS: (%)	38.2%	15.8%	8,9%	37.1%

those discussed under the Bourne East section except that negative effects due to groundwater retention are less at Bourne West since spray irrigation facilitates the rapid reduction of groundwater. However, additional negative impacts seem inevitable in view of planned expansion of camp sites (between 600 and 2000), trails and other recreational facilities in the State Forest. There is little evidence to support assumptions that recreation and spray irrigation can coexist on a daily basis. Not enough information has been clearly defined or established pertinent to either public health impacts or user response.

The effects of land application areas and facilities will depend on detailed site characteristics, facility design, operation variables, (e.g. the height and spacing of heads, valves, connecting pipelines, monitoring wells, etc., and the rate, frequency and timing of operation) and the ecological response to these. The last includes changes in vegetation and local water quality, appropriate to other reports. In any case the scale of the impacts can range from site specific to regional. These impacts will reflect the presence of the facilities in the immediate region, more than the effects of the system on the area being served. By definition, the pattern of sewer service availability in the metropolitan area will be the same as under Concept 4. The study area will need smaller and slightly fewer treatment plants than required under concepts which provide all tertiary treatment in the study area, and will experience some reduced stream flows. Nonetheless, the main impact' will be in the immediate vicinity of the application sites.

Given the relatively slow growth of most of Southeastern Massachusetts and the remote character of most of the sites, land application should have little effect on regional growth patterns. Since the force main carries secondary effluent, it, in itself, should not encourage or facilitate local development along its path as regular interceptors within the study area might. Allowing local communities to tie into it (not presently proposed) would probably do little more then lessen their costs for tertiary treatment.

There appear to be no regional open space plans comparable to the MAPC Plan. However, the Department of Natural Resources has been improving the recreation facilities in the state forests, and the effects on these areas will need close examination. Inevitably, certain areas will be less useful due to the need to restrict access during spraying and after spraying. On the other hand, the largest spray area in the Myles Standish Forest is generally in a burnt-over area which has little current active recreation value. Some of the proposed spray areas outside the forest would have a beneficial land banking effect in holding undeveloped land next to the forest for future public use.

The vast area available and the extensive existing facilities give Otis Air Force Base great potential for regionally significant development. This could be compatible with the proposed rapid infiltration area since it would be in the least developed part of the reservation.

The proposed land application sites are generally compatible with available local planning information. Most sites are on land designated for future open space, low density housing, agriculture or vacant land. These generally appear to be residual recommendations rather than specific proposals. Thus, the open space recommendations usually refer to state forest land rather than to specific local facilities and the agricultural recommendations refer to woods rather than to valuable cranberry bogs. Similarly, low density housing recommendations usually reflect inaccessable, marginal land rather than particularly desirable estate areas.

No unique historic or cultural sites appear to be affected, and as we understand it, the spray sites can be altered to exclude small cemetaries, etc. (such as the one near site #6 in Plymouth) which might be found.

Traffic patterns are generally unaffected since the sites are set back from major roads. The one conflict noted is with the extension of Route 25 which is planned to go through a 30 acre portion of the Bourne-West Rapid Infiltration Site. This should leave the main 335 acre portion of that site intact, and if built as a limited access highway, it could form a good boundary to the remaining site.

Two new subdivisions, Heritage Hills in Plymouth and Seawoods Springs in Wareham, conflict with proposed spray irrigation sites. They appear to be relatively inactive and are at the edge of spray irrigation sites.

Generally the location of spray sites in back areas away from development should minimize impact on local development. With suitable buffering the sites should blend into the surrounding woodlands. As noted, the sites will remove some otherwise developable land from the market. This might slightly slow and redirect growth particularly in rapidly developing Plymouth, and bears closer examination.

The characteristic regional vegetation and landscape forms are scrubby low hills, offset by a network of ponds, small streams, wetlands and closely related cranbery bogs. The spray sites are designed to stay away from all these water bodies and are concentrated on the higher dry ground. They should have little effect on the land form since the readily permeable soils are expected to require little in the way of berming, trenching, underdrain installation or other surface alternations.

The spray sites are expected to alter vegetation by increasing the growth of the existing scrub oak and pine, and by encouraging succession of a wider range of less drought tolerant plants. Thus larger trees and shrubs growing near the ponds and those starting from wind blown and bird carried seeds may gradually take over. In addition excess watering reportedly might weaken root systems while encouraging growth thereby leading to many blown down trees in windy weather. The first effects might be more attractive though less distinctive than the present landscape. The net effect would depend on the value placed on the present characteristic Cape landscape. The blown down trees would be unattractive, and presumbably a fire hazard, though perhaps good for wildlife.

The rapid infiltration sites will require drastic changes in land form since they require extensive lagoons. These might be visually appropriate to the extent that they resemble the present ponds, but the chances are that the result will be clearly man-made.

The 2,791 acres of storage lagoons will be similarly man-made unless some natural storage areas can be found. These are yet undefined. Though the rapid infiltration areas will have a major land form impact, they will use relatively little land in proportion to their capacity.

The effects of land application on access to the countryside are marginal. The system will undoubtably require new rights-of-way, which could be used by hikers, snowmobiles, horsemen, etc. Yet, the Cape woods already have extensive dirt roads, and many gas pipeline and powerline rights of way.

In all, the land application approach may have an acceptable landscape impact if the results of spray irrigation are generally positive, and if the rapid infiltration sites are either well-buffered or designed so that the resulting lagoons complement the surrounding pattern of hills and ponds.

Environmental impact needs considerable definition. Both approaches will improve the quality of the treated water, but their effects on local water is unclear. The main visual impact will be the response to the increased ground and surface water. Generally, this is expected to be favorable in terms of supporting plants, and maintaining stream and pond levels. Water quality effects will be carefully monitored, but their visual manifestation is not yet known.

Available information suggests that the visual, cultural and design impacts of Concept 5, can be acceptable if:

1, Storage lagoons can be sensitively designed and located;

2, Spray areas can be used for open space and recreation much of the year;

3, Changes in vegetation lead to a diverse, healthy plant community, adding variety to the landscape;

4, Spray areas help to hold extensive back areas open for long term public use;

5, Access to usable open space is increased when appropriate and safe;

6, Natural filtering is effective enough, and sufficiently monitored to avoid excess nutrients in ponds;

7, Local and regional planning agencies co-operate to accommodate the extensive space demands of land application with other land use needs.

CONCLUSIONS, RECOMMENDATIONS AND COMMENTS:

Regional: It is generally agreed that sewerage systems are potentially development generators. These systems can have a direct bearing on both the pace and direction of growth in any given area or region. They have the potential for significant spatial and visual implications and resultant consequences, especially when applied over relatively large regional areas. They can either support existing development trends, guidelines, and proposals, or can present rather unique opportunities to develop and refine new and perhaps more definitive programs for regional growth and general land use.

The most consistant feature of all of the five project concepts is their uniform provision of sewerage treatment for every community within the BH-EMMA by, or shortly after, the year 2000. However, while the concepts do provide the potential for service, they do not assume the total sewering of all communities. In some of the less developed communities, the population proposed to be sewered by the year 2000 is often no more than two-thirds or three quarters of their projected populations for 1990.

The ability of some of these "post 2000" communities to resist pressures to provide service before 2000 is open to question. Many of the more developed communities lie around the perimeters of the study area. Proposed interceptors to these communities often run through, or quite close to, the borders of post 2000 communities. For example, the interceptor connecting Wrentham to the Medway plant (Concepts 1, 2 and 4) runs through Norfolk, a post 2000 town. Under Concept Three, this same interceptor continues on and runs between the post 2000 towns of Sherborn and Dover en route to the MDC interceptor in Natick. While the interceptor is not proposed to serve any of these communities until post 2000, it does seem logical to assume that its proximity to these towns could lead to increased development pressures on the various governing bodies and control agencies of these communities.

The five project concepts are potentially inconsistant with regional development and density patterns recommended in the MAPC's Composite Development Guide.

Most of these inconsistancies are directly related to the uniformity of service that is common to all concepts. The Composite Guide features alternating corridors of high and low density development. These corridors are radial from the core city and generally extend out into the Route 495 area. If the project concepts concentrated interceptors and/or regional facility services in these areas, they would strenghten the density proposals, help to concentrate development, and, in areas where recommended densities have been met or exceeded, they would provide needed community services. Application of similar services in the low density corridors would tend to blur the corridors and obscure their spatial and visual differences.

The concepts are potentially inconsistant with regional open space and recreational programs. Again, the principal factor appears to be the concept's uniformity of service. MAPC Open Space and Recreation Plan studies indicate that the region is seriously deficient in recreation areas and facilities. The major proposals of the studies are the continued and accelerated acquisition and development of general purpose open space as well as more specialized forms of public and semi-public open space and recreational facilities. The studies predict that acreage needed for these programs by 1990 will be more than twice the currently existing acreage. Competition for available land would seem to be the key factor. If density corridors were developed, the low density corridors might offer more potential for land acquisition.

For the same reason, the concepts do not appear to encourage the preservation of small, quality landscape areas as recommended in "Appendix N" of the NAR report. As before, the issue appears to be increased competition for available acreage. Expanded muncipal facilities and related development generally result in a changing economic cycle that eventually surfaces as increased land costs. This has a direct bearing on the feasibility of acquiring land solely for its amenity value.

In total, all three of these potential inconsistancies relate directly to what is perhaps the most significant visual-cultural and design impact resulting from the implementation of any of the project concepts. This impact is the potential change in the regional

visual-cultural asthetic "baseline condition". The composition of this baseline asthetic is a unique, harmonious blend of the natural and the man-made. It is a continual visual experience. It is the conscious awarness and enjoyment of the continually changing arrangement of the elements and features of our environment. It is especially unique and valuable in this area due to the degree of change and the variety of visual experiences offered within relatively short travel times and distances. Many feel it is a prime factor in the region's ability to attract and hold professionals and other highly skilled personnel needed to support and develop our changing, service-oriented economy.

Changes in the baseline asthetic are secondary impacts, (i.e. going beyond the basic water quality concerns) associated with development and increased use of structured wastewater collection systems. These impacts would generally include changes in overall landscape pattern, surface water, vegetation, and to some extent, land form. Most of these secondary impacts relate to reductions in rates and amounts of natural percolation which, in many areas, will aggravate already unstable groundwater conditions. A gradual "drying" of surface soils and lowered water tables could be harmful to vegetation, especially species with shallow root systems. This could also accelerate natural, gradual succession and encourage the development of new plant material, some of which may not be as attractive or as desirable as the existing species. Lowered water tables could have significant visual impacts such as lower levels of impounded water and reduced stream flows. The magnitude of these impacts would be greatly increased during prolonged drought periods. Also, if development reached the point of requiring structured storm drain systems, these impacts could be magnified by as much as 1000 percent.

Many of these potential impacts cannot be accurately projected without input from the other impact assessors. Even then, they may be beyond the scale and scope of these reports and require additional, more detailed investigation by other professional disciplines. The important point is to be aware of their potential significance and weight them properly during the screening and review processes.

Even though simple rapid infiltration lagoons might replace more standard outfalls at some plants (soils permitting) we assume that all of the concepts discharge some treated effluent into inland streams and rivers. The locations of discharge points and the volumes of effluent vary from one concept to another. In most instances, the volumes of effluent are large enough to generate significant impacts. For example, the average flow of the East Branch of the Neponset River in the vicinity of the proposed South Canton facility is about 50 cfs. Total effluent discharged from that plant by the year 2000 is approximately 39 cfs. In other words, the Canton South plant will generate a 75 to 80 percent increase in the average yearly flow of the East Branch. Another example is the combined discharges of the Hopedale, Medfield and Medway plants. They represent the addition of 25 cfs to the upper Charles River. The nearest recorded flow figures for the river are taken downstream from these plants, in the Charles River Village area. At this point, river flows average about 295 cfs. In raw figures then, the 3 plants increase river flows by 8 to 10 percent. However, it is likely that this figure is somewhat conservative due to the separation of the data reference points. Further upstream the average flow of the river is probably less than 295 cfs, and the added 25 cfs can be expected to have a more significant impact.

Most of the impacts associated with increased stream flows are generally thought of as being positive. Added volumes of what may be considered "better quality" water should improve the visual appearance of the surface waters and adjacent river banks. Expanded recreational opportunities are often associated with improved water quality and increased flows. The discharge of effluent into inland water bodies rather than the ocean does have the benefit of some water being retained for percolation. This could be especially significant in areas that depend on well fields for their water supplies.

There are some potential negative impacts associated with increased stream flows. Increased water depths may reduce the range and variety of visual experiences on some streams by eliminating shallow

water, deep water transitions. Focal points created by current interaction with exposed or partially submerged rocks may lose much of their dramatic impact. Water edge vegetation may prove intolerant to increased flows. Larger and more ecologically fragile areas such as swamps and marshes may be adversely effected by the introduction of effluent discharges.

In reality, we may be placing to much emphasis on the various visual-cultural and design impacts related to stream effluent discharges. When compared to other impacts, particularly those related to the asthetic baseline condition, their importance may be relatively insignificant. Also, the findings and conclusions of the hygenic and ecological impact assessments may indicate that effluent discharges do not produce a "better quality" condition in all instances.

Implementation of any of the concept proposals should not have a significant affect on the current levels of air quality within the study area. On the state and local levels, air quality control is the responsibility of the Commwealth of Massachusetts, Department of Public Health, Bureau of Air Quality Control. This bureau has established definite plan review procedures as well as control standards and testing methods for emissions from wastewater treatment facilities. While their control standards for sludge incineration are somewhat more stringent than those in the Federal regulations, the two regulations are very similar on most key issues. The Federal regulations are part of the EPA Clean Air Act and they establish "Standards of Performance for New Stationary Sources", which includes wastewater treatment plants. These regulations became effective in February, 1974 and apply to new plants as well as those that began construction in June, 1973.

The majority of the proposed interceptors delineated on their respective concept plans do not seem to relate to existing or planned rights of ways or transportation corridors. The interceptors seem to follow along side brooks, streams and rivers and other natural drainage channels. For example, the proposed interceptors for the Hamilton and Middleton plants follow along the Ipswich River. Interceptors from the Brockton facility follow the Salisbury Plain River and West Meadow Brook.

One rather obvious exception to this pattern is the mole tunnel that connects the Woburn, Medford, Watertown, Dedham and Canton (95/128) plants. From the Woburn plant, the tunnel appears to follow along under Route 93 down to the Medford plant. From Medford to Canton, the path of the tunnel does not appear to follow any readily apparent rights of way or transportation corridors. However, from Canton south, the surface force mains follow Routes 24 and 25 to the general vicinities of the spray irrigation and rapid infiltration sites.

Since the majority of the interceptors seem water oriented, they do represent a unique opportunity for the development of trail systems. These trails could be short inter-community systems, or long interconnecting networks. With adequate side slopes and surface treatments, they could be used for hiking, bicycle riding or a combination of both.

Region; Summary: The most consistant feature of all project concepts is their uniform provision of sewerage treatment for every community in the BH-EMMA by, or shortly after the year 2000.

The most significant visual-cultural and design impacts resulting from the implementation of any one of the five project concepts are the potential changes in the region's baseline asthetic.

All of the concepts are somewhat inconsistant with regional development guides, land use plans and open space proposals.

The majority of proposed interceptors are not intergrated with existing or planned rights of way and transportation corridors.

Implementation of any project concept will not have a significant impact on the quality of air within the BH-EMMA or its Concept Five extension.

As proposed, the concepts do not fully utilize some of their inherent potentials. For example, if we assume that the positive impacts of increased stream flows are significant, it seems logical to assume that the impacts would have an even greater significance if

the effluents were discharged further upstream. Could abandoned MDC interceptors be used as "casements" for internal, reverse gradient pipes that would carry this effluent upstream? Could proposed treatment plants also function as booster pumping stations for these flows?

Site Specific: Of the 31 individual plant facility sites proposed in Concept One, 20 of them are either existing, operational plants or currently under construction. Of the remaining 11 plant/facility sites, 7 are considered adequate for the construction of a wastewater treatment plant (Brockton, Chelmsford, Essex, Gloucester Lanesville, Hull, Middleton, Sudbury). Three sites were considered not acceptable for the construction of a wastewater treatment plant (Gloucester 133, Hamilton, Medway). One site was not rated (Gloucester Magnolia) due to the lack of exact site definition. Expressed as a percentage of total concept plant/facility sites, 9.7 percent of the sites in Concept One were not recommended for plant construction. As a percentage of total new, raw land sites, 27.3 percent were not recommended for plant construction.

Concept Two adds 5 new suggested "raw land" plant sites to the 11 contained in Concept One. Three of these (Canton North, Dedham, Framingham) were considered acceptable for the construction of a wastewater treatment plant. Two were considered unacceptable for the construction of a wastewater treatment plant (Canton South, Watertown). Expressed as a percentage of total concept plant/facility sites 13.9 percent of the sites in Concept Two were not recommended for plant construction. As a percentage of new, "raw land" sites within Concept Two, 40.0 percent were not recommended for plant construction.

Concept Three Metropolitan Sewerage District expansion eliminates 3 sites contained in Concept One. One of those sites is not recommended for the construction of a wastewater treatment plant. Expressed as a percentage of total concept plant/facility sites, 7.1 percent of the sites in Concept Three were not recommended for plant construction.

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WASTEWATER ENGINEERING AND MANAGEMENT PLAN FOR BOSTON HARBOR - --ETC(U)
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2 OF 3
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Concept Four adds 6 "raw land" plant sites to the 11 contained in Concept One. Three of these were considered suitable for the construction of a wastewater treatment plant (Dedham, Framingham, Woburn). Three were considered unsuitable for wastewater treatment plant construction (Canton 95/128, Medford, Watertown). Expressed as a percentage of total concept plant/facility sites, 16.2 percent of the sites in Concept Four were not recommended for plant construction. As a percentage of "raw land" sites within the concept, 50.0 percent were not recommended for plant construction.

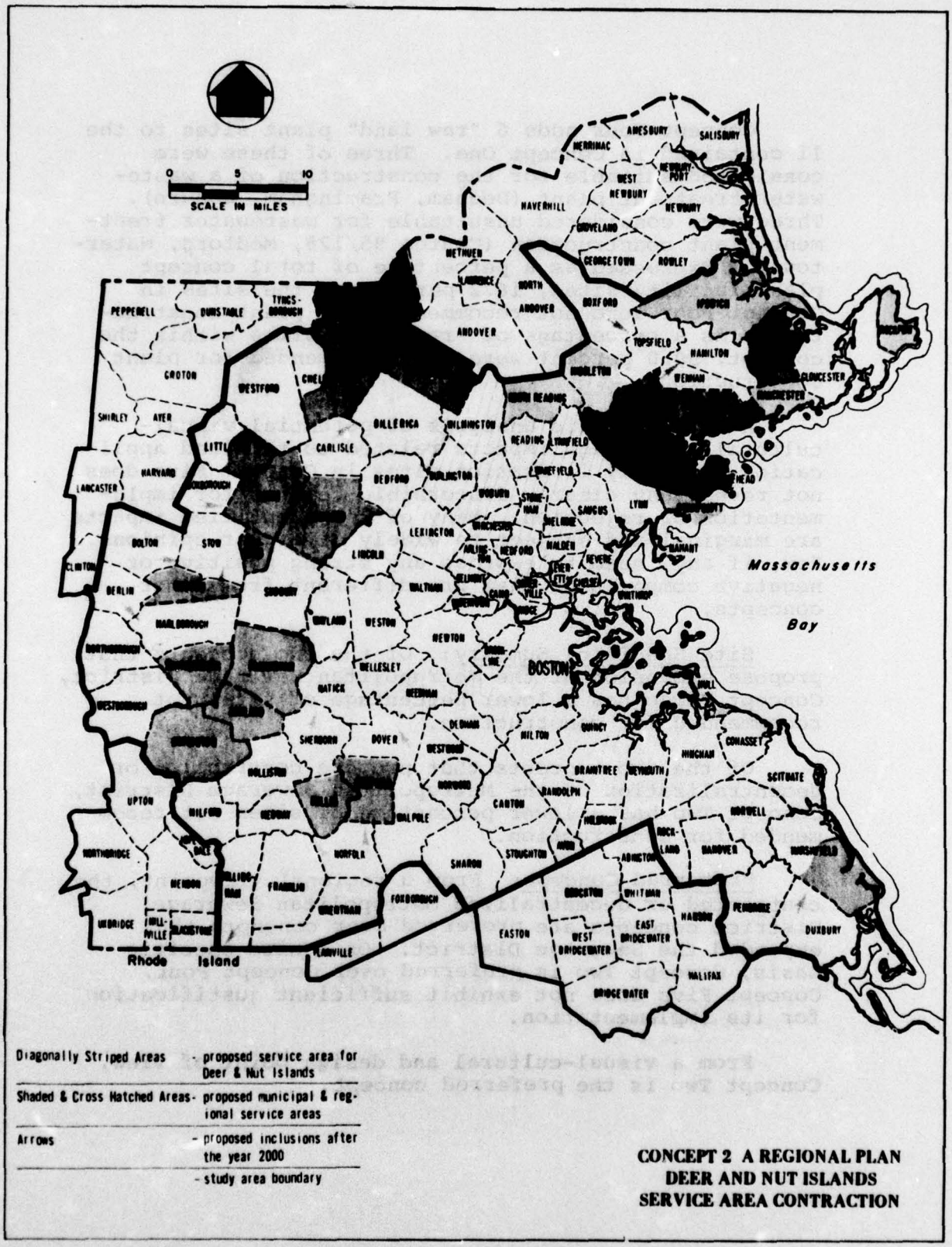
A site specific analysis of potential visual-cultural and design impacts related to the land application and spray irrigation sites in Concept Five does not reveal any clearly discernible reasons for implementation or rejection. Many of the identified impacts are marginal and subject to widely divergent opinions. Few, if any, seem to express any strong positive or negative comparisons that are different from other concepts.

Site Specific; Summary: Of the two concepts that propose expansion of the Metropolitan Sewerage District, Concept Three has a lower percentage of sites not recommended for construction.

Of the two concepts that propose contraction or decentralization of the Metropolitan Sewerage District, Concept Two has a lower percentage of sites not recommended for construction.

Preferred Concept: From a regional viewpoint, the contracted or decentralized Metropolitan Sewerage District concepts are preferred over concepts that expanded the Sewerage District. On a site specific basis, Concept Two is preferred over Concept Four. Concept Five does not exhibit sufficient justification for its implementation.

From a visual-cultural and design point of view, Concept Two is the preferred concept.



Diagonally Striped Areas	- proposed service area for Deer & Nut Islands
Shaded & Cross Hatched Areas	- proposed municipal & regional service areas
Arrows	- proposed inclusions after the year 2000
	- study area boundary

CONCEPT 2 A REGIONAL PLAN
DEER AND NUT ISLANDS
SERVICE AREA CONTRACTION

The Selected Concept: The Technical Subcommittee* of the BH-EMMA has developed its recommendations for wastewater treatment within the project study area. While these recommendations represent a consensus of the agencies on the subcommittee, they are not final, and they will be presented to, and reviewed by, the general public as well as various Federal, state, and local agencies.

The subcommittee's recommendations are referred to as the Selected Concept. Basically, this concept is Concept One modified to include three additional advanced wastewater treatment facilities. These facilities are located in Woburn, Canton and Wellesley. The key points of the Selected Concept are:

1. To maintain the current service area of the Deer Island plant.

2. To minimize expansion of the Nut Island Plant.

3. To increase flows in the Aberjona, Charles and Neponset Rivers.

The Woburn facility is identical to the plant proposed in Concept Four but, with a greatly reduced flow. This plant would treat a small portion of its Concept Four service area, the rest of the flow going to the Deer Island plant. Treatment would be of a very high level and projected flows are about 2 mgd. In reality, it would appear that the prime function of this facility is low-flow augmentation for the Aberjona River.

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*Agencies on the subcommittee are: The Metropolitan District Commission (Chairman), the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the Commonwealth's Department of Public Health, Division of Water Pollution Control and Resource Management Policy Council, and the Metropolitan Area Planning Council.

SELECTED CONCEPT: STREAM FLOW COMPARISON

Facility Location	Woburn	Canton	Wellesley
Receiving Stream	Aberjona River	Neponset River	Charles River
Average Plant Discharge (yr. 2000)	2 mgd	30 mgd	30 mgd
Upstream Effluent Discharge (mgd)	0	0	16
10 yr. - 7 day Low Flow (mgd)	0.25	7	7
July thru Oct. Average Flow (mgd)	5	40	80
Annual Average Flow (mgd)	18	95	195
100 yr. Flood Flow (mgd)	790	1300	2650

Source: U.S. Army Corps. of Engineers

On a site specific basis, the previously identified potential negative impacts resulting from the construction of this facility (page 61) should be greatly reduced due to the reduction in the overall size and area requirements of the plant.

The Canton facility is identical to the facility proposed in Concept Four (Canton, 95/128). Projected flows are 30 mgd in the year 2000. This plant will reduce flows to the Nut Island plant in Boston Harbor and increase flows in the Neponset River.

The Wellesley facility is a new proposal. The plant's service will include Wellesley, Framingham, Natick, Ashland, Hopkinton, and Southborough, as well as parts of Dover and Sherborn in the future. Flows from this plant will be about 30 mgd in the year 2000. Like the Canton facility, this plant will increase flow in inland waterways, in this instance, the Charles River.

The suggested site for this plant is in Wellesley on the bank of the Charles River, on the nothern portion of land currently being used by the Stigmatine Fathers. From the standpoint of potential visual-cultural and design impacts, the site seems suitable for the construction of a treatment facility.

Significant positive impacts generated by the plant are increased flows in the Charles River, particularly during low flow periods (this area of the river is very attractive and is heavily used by canoeists and other boaters). Also, with the exception of Southborough and Hopkington, the plant should provide services consistant with the MAPC's Composite Development Guide.

A comparison of the Selected Concept and Concept Two (Preferred Concept, page 79) reveals many similarities. Under both concepts, the Marlborough East plant becomes a municipal facility. Both concepts reduce flows to Nut Island by about the same amount (assuming that the Watertown plant is unexceptable and its service area flows will go to Deer Island). Both Concepts have similar relationships to the MAPC Composite Development Guide.

The principle differences between the concepts are that the Selected Concept has fewer plants than Concept Two, and it also reduces the service area of the Woburn facility. While these differences are small, they are, from a visual-cultural and design viewpoint, sufficient to recommend the Selected Concept over the previously preferred Concept Two. This decision assumes that the previous recommendation regarding an alternate site for the Canton plant is feasible and will be investigated.

In November, 1975, prior to the development of the Selected Concept by the Technical Subcommittee, a meeting was held involving representatives of the Corps of Engineers and all of the impact consultants* involved in the BH-EMMA study. The purpose of this meeting was to review the final draft conclusions and comments of the impact consultants and attempt to develop a hybrid concept consistent with this review. A hybrid concept was developed but, perhaps more important to an overview of the BH-EMMA study project are the general conclusions that the impact consultants formulated at that meeting.

1. Concepts One and Three require maximum expansion of the Deer and Nut Island facilities. While definitive proposals for expansion of these facilities were not presented to the impact consultants, it was generally concluded that expansion would require extensive filling of Boston Harbor, especially at Nut Island, with resulting negative asthetic and ecological impacts.

2. The volume of harbor discharges proposed by Concepts One and Three may have an adverse effect on inland surface water levels and groundwater tables.

3. The centralized concepts tend to preclude opportunities for water reclaimation.

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*Visual-cultural and Design, Hygenic, Socio-Economic and Ecological.

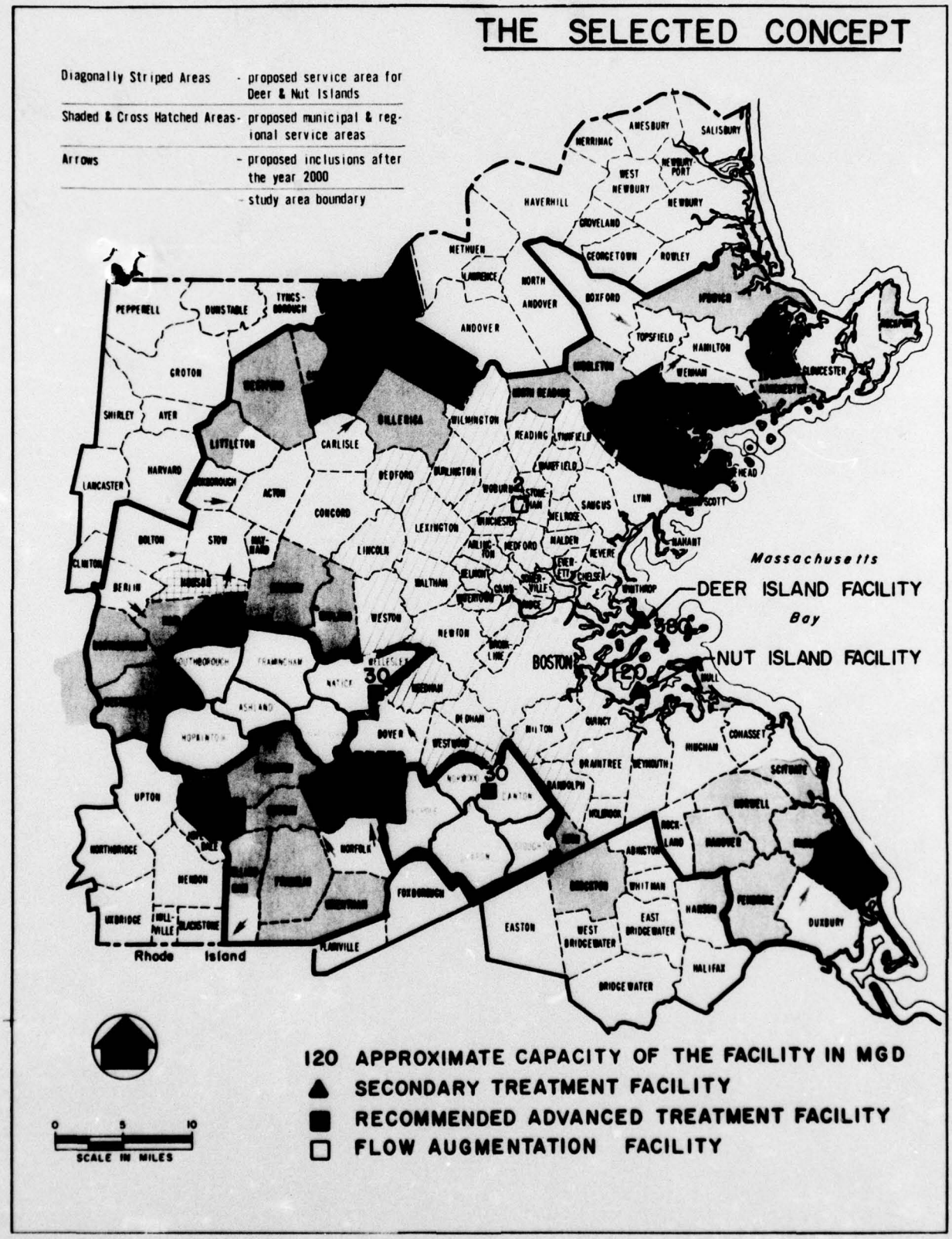
4. The centralized concepts could homogenize development patterns contrary to regional planning recommendations. This could have significant impacts on the regions over all asthetic quality.

5. The attempt to decentralize treatment in Concepts Two and Four seems too limited since the "decentralized" new systems are actually centralized subregional systems, each serving 4 to 6 towns. As a result, many have local and regional land use conflicts.

6. In most instances, discharging effluent into inland waters will not significantly improve the quality of these waters. With the simultaneous removal of landfill leachates and other pollutants, the discharge of treated effluents would, at best, maintain current water quality levels. Thus, with respect to water, the greatest difference between the concepts seems to be water quantity and the potential for reclaimation and eventual treatment and reuse, rather than water quality.

It was felt that a more decentralized system would be generally more acceptable. Use of many smaller discharge points would lessen effluent impact and help to maintain upstream water levels. The smaller individual plants would also lessen site impacts (despite the increased total acreage used). In addition, development impacts could be controlled better by dealing with smaller, more discrete service areas whose inclusion could be programmed to implement regional land use goals. Thus, a completely decentralized system was generally preferred, given acceptable capital and operating costs and the availability of sufficient discharge points or small, land application sites.

THE SELECTED CONCEPT



APPENDIX A

BASELINE DATA

AND

COMPLETED MATRIX FORMS

FOR

ALL PLANT/FACILITY SITES

CONCEPTS ONE, TWO, THREE, & FOUR

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Billerica. USGS Quad Billerica.

Watershed Concord River. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

X existing facility

___ explicit by M & E

___ explicit by others

___ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

X Primary Existing

X Secondary under construction

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 6.4, 2020 9-4, 2050 11.

Plant/Facility; needed area (acres)

2000 7.0

Plant/Facility; areas served Billerica, plus Carlisle after 2000

Site Specifics:

Terrain: Generally flat; minor pitch down to river.

Vegetation: Generally open; surrounded by deciduous on three sides.

Soils:

Special features: Existing facility is in process of major expansion & construction project. Site does not appear to have any special natural features. River not now visible from any part of the site.

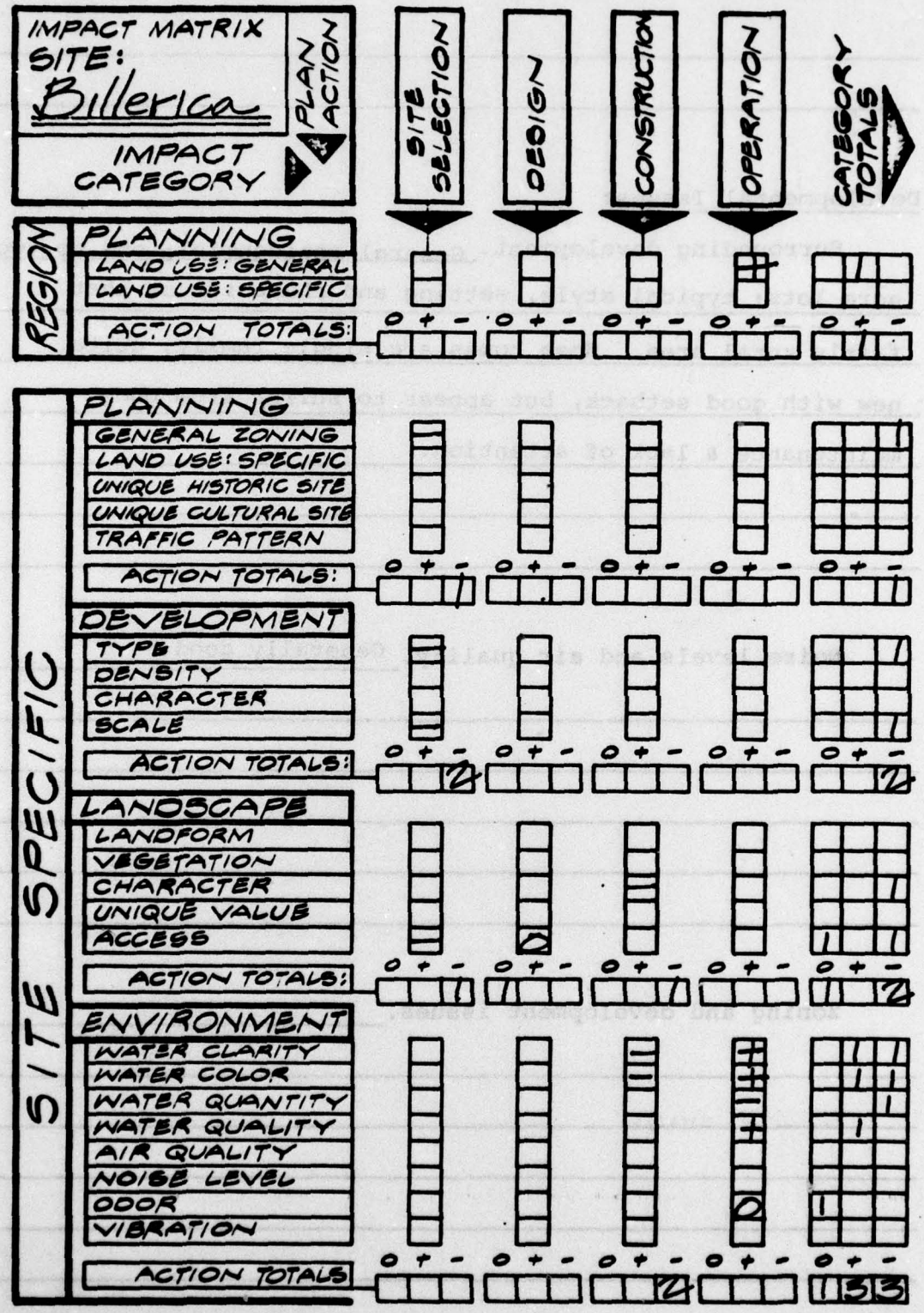
General site character: Typical bottom land with "edge" vegetation. Site is isolated and doesn't conflict with residential development general to the area. Conflict will take place if development continues in direction of plant.

Developmental Issues:

Surrounding development. General residential; one to two acre lots; typical style, setting and character of that fairly rural area. Most homes are single family, quite new with good setback, but appear to suffer from poor maintenance & lack of attention.

Noise levels and air quality. Generally good.

Zoning and development issues.


IMPACT MATRIX
SITE:
Billerica
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Brockton. USGS Quad Brockton.

Watershed Taunton. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
____ explicit by M & E						
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) extensive adjoining land

Plant/Facility type

____ Primary _____

X Secondary existing (12 mgd)

X Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 Avon 3.2, 2020_____, 2050_____.

Plant/Facility; needed area(acres)

2000_____

Plant/Facility; areas served Brockton, Avon, & possibly Abington in future

Facility is outside study area, but is proposed to handle flow from Avon which is in study area

Site Specifics:

Terrain: low, Salisbury Plain River Flood Plain rising slightly to east.

Vegetation: Misc. hardwoods and shrubs.

Soils: Fine sandy flood plain loam (Saco)

Special features: Great proximity to river and to Main Street. Sludge is being dumped on partially diked lands south of the plant.

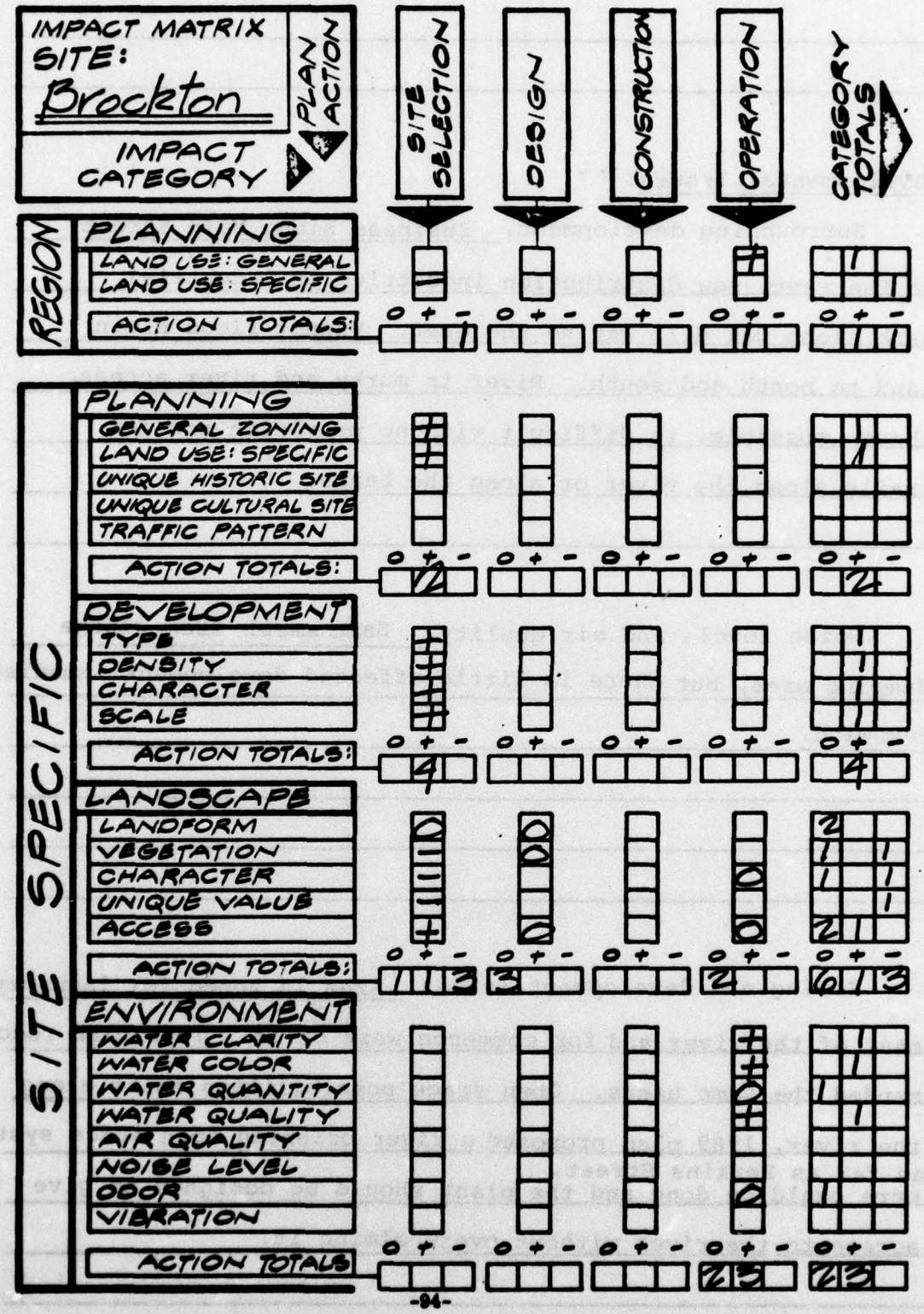
General site character: secluded and well screened despite proximity to Main St. across the river.

Developmental Issues:

Surrounding development. Business along Main Street to the west, new distribution industries in industrial park along Oak Hill way to the east. Vacant flood plain land to north and south. River is murky and river access, though possible, is difficult with no provision now for trails along the river or along the banks.

Noise levels and air quality. Same smell from sludge dumping area, but there is little affected development immediately downwind.

Zoning and development issues. Area is zoned for industry east of the river and for commerce west of it. 1969 plan recommended the same users. Open space possibilities exist along the river. 1969 plan proposed a river oriented open space system as far as Perkins Street, more could be done and the plant should be designed to give access to the river without overwhelming it.


IMPACT MATRIX
SITE:
Brockton
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Canton (SW 95/128). USGS Quad Norwood.

Watershed Neponset River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility				X	X	

X ____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

X ____ Secondary proposed, Concept 5

X ____ Advanced proposed, Concept 4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 (4)30 (5)27, 2020 (4,5)36, 2050 (4,5)39.

Plant/Facility; needed area (acres)

2000 (4,5)25

Plant/Facility; areas served Canton, Norwood, Sharon, Stoughton, Walpole, Westwood.

Site Specifics:

Terrain: Flat freshwater marsh stretching to south with low hills to east and west.

Vegetation: low trees, 40% grass, 10% brush

Soils: probably typical marsh soil, peat.

Special features: Site is immediately bounded on north and east by RTES. 128 and 95, and is bounded on west by RR tracks and C.C. & F's Westwood Industrial Park.

General site character: Marsh confined by highways and railroad. Site is apparently determined by present MDC interceptor following Neponset River.

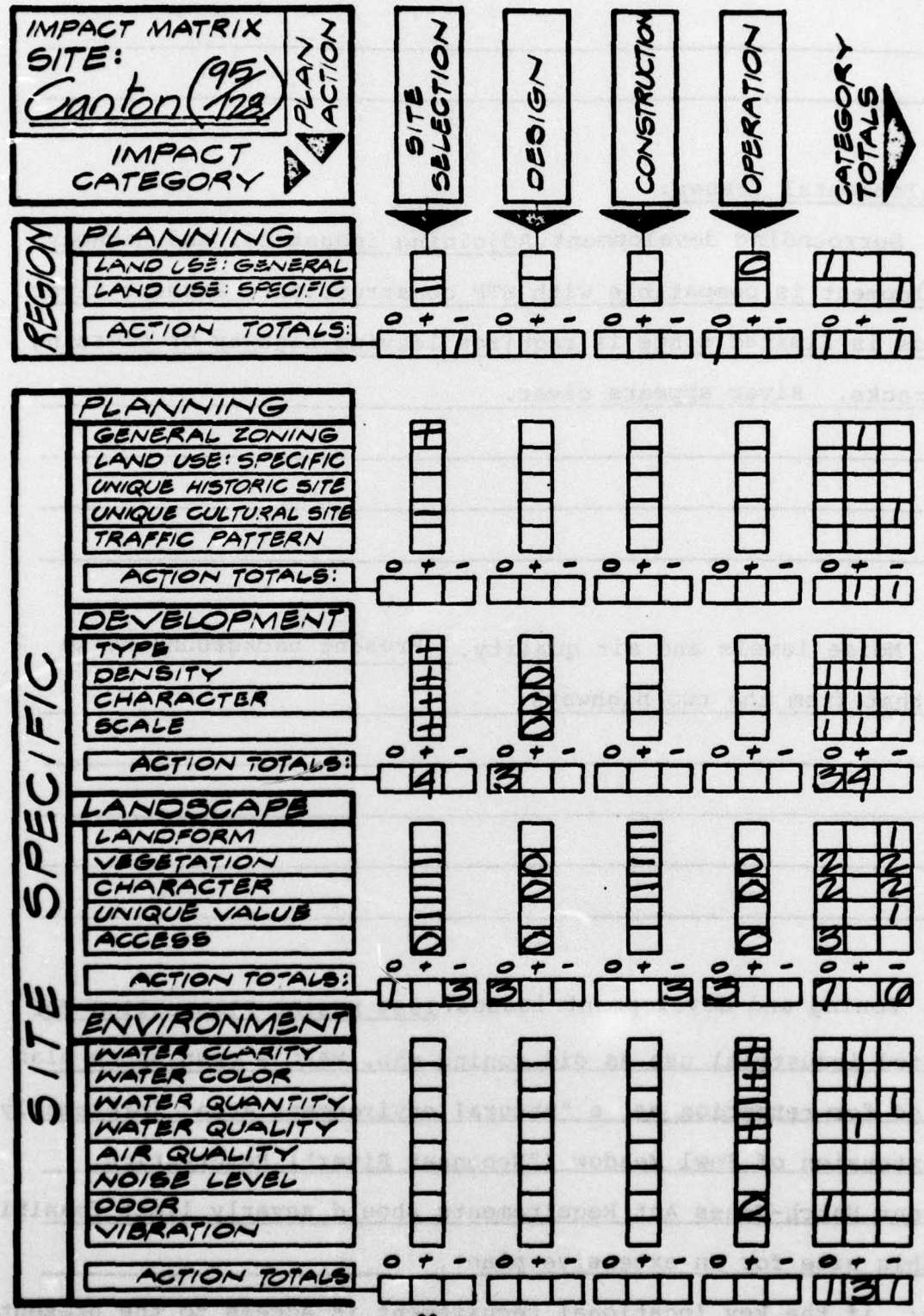
Developmental Issues:

Surrounding development. Adjoining industrial and highway development is compatible with STP construction. Present River access is limited since it requires leaving highway or crossing RR tracks. River appears clear.

Noise levels and air quality. Present background noise is that from the two highways.

Zoning and development issues. 1959 Master Plan called for limited industrial use as did zoning map. MAPC's open space plan called for retention as a "natural environment area" (presumably an extension of Fowl Meadow ("Neponset River") Reservation. Present Hatch-Jones Act Requirements should severly limit feasibility of this site for an extensive plant.

Note: if the key locational requirement is access to the present interceptors the possibility of moving the site about 2600' South to higher ground just east of the junction of the two interceptors feeding this site should be expanded.


IMPACT MATRIX
SITE: Canton (95, 128)
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location North Canton. USGS Quad Norwood.

Watershed Neponset River. Used in Concepts

Site Designation

1	2	3	4	5	All
	X				

____ existing facility

__X__ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known)_____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 5.5, 2020 8.0, 2050 8.2.

Plant/Facility; needed area(acres)

2000 6.3

Plant/Facility; areas served Westwood and parts of Canton, Dedham and Norwood.

Site Specifics:

Terrain: Marsh and swamp extending along the river North and South, bordered by higher land and low hills to east and west.

Vegetation: Marsh grass, shrubs and low trees.

Soils: Presumably typical marsh soils

Special features: site is bordered to north by a trucking terminal and light industry, and on the west by RR tracks and beyond that, housing. Only open areas are to north, west and south along marsh and east toward the Blue Hills Reservation.

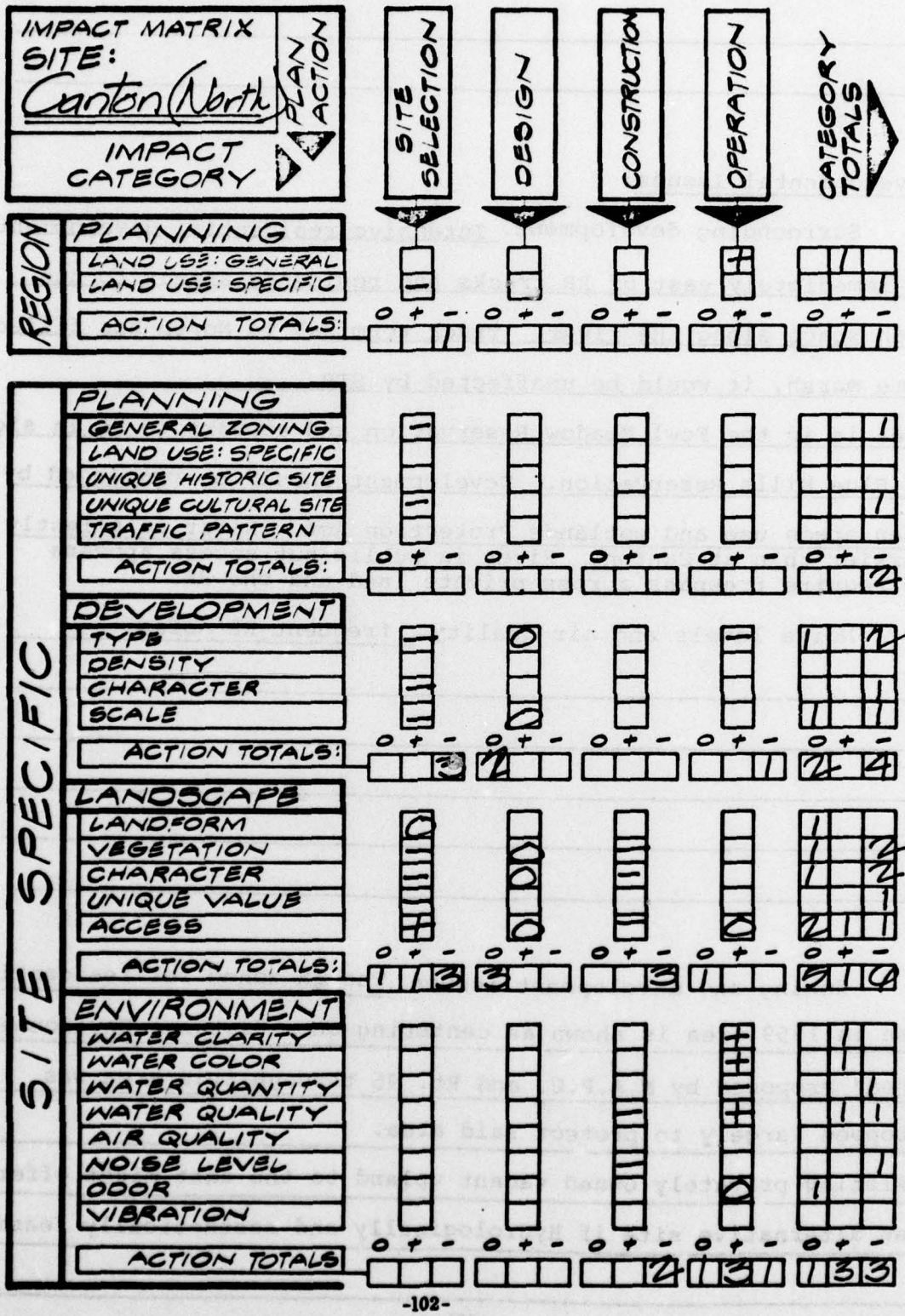
General site character: Marsh and river attractive for hiking and fishing.

Developmental Issues:

Surrounding development. Intensive residential development is immediately east of RR tracks and residents appear to use open space along the river. Truck terminal to North has filled some marsh, it would be unaffected by STP. Area is in the Fowl Meadow Reservation and appears to be in sight of Blue Hills Reservation. Development should be precluded by open space use and wetlands Protection Act. River is slightly murkier than at Canton. River is public but access appears to require trespass across private land and the RR.

Noise levels and air quality. frequent RR noise

Zoning and development issues. Though zoned for residential use in 1959 area is shown as centering on a "Natural Environment Area" Proposed by M.A.P.C. and Rt. 95 through this area was stopped largely to protect said area. Existing privately owned vacant upland to the east might offer an alternative site if Hydrologically and aesthetically feasible.


IMPACT MATRIX
SITE: Canton North
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location South Canton. USGS Quad Norwood.

Watershed Neponset River. Used in Concepts

Site Designation

1	2	3	4	5	All
	X				

____ existing facility

__X__ explicit by M & E (apparently at the junction of interceptors from Canton & Norwwod)

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known)_____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 25, 2020 30, 2050 32.

Plant/Facility; needed area (acres)

2000 21

Plant/Facility; areas served Sharon, Stoughton, Walpole and parts of Canton and Norwood.

Site Specifics:

Terrain: Marsh; the only elevation is at the edge of bordering roads, on a filled (?) light industrial site and along a general upslope about 500' south west of the dege of the indicated area.

Vegetation: Half low trees, half grass and shrubs. Landscape needs control of intrusion of marsh by trees in order to maintain open marsh character.

Soils: Presumably typical marsh soils plus made land on adjoining light industrial and truck terminal sites.

Special features: Site is bounded by the Neponset River and Rt. 95 to the west, Neponset St. to the south, continuing marshes to the north and by residentially developed low hills to the east. 6-8 acres of rundown truck terminal and construction yards are in the center of the site just off of Neponset St. A small branch of the Neponset River flows west into the river just south of the site.

General site character: Flood plain at the edge of a marsh with wooded swamp screening the plant site from houses on the low hills to the east.

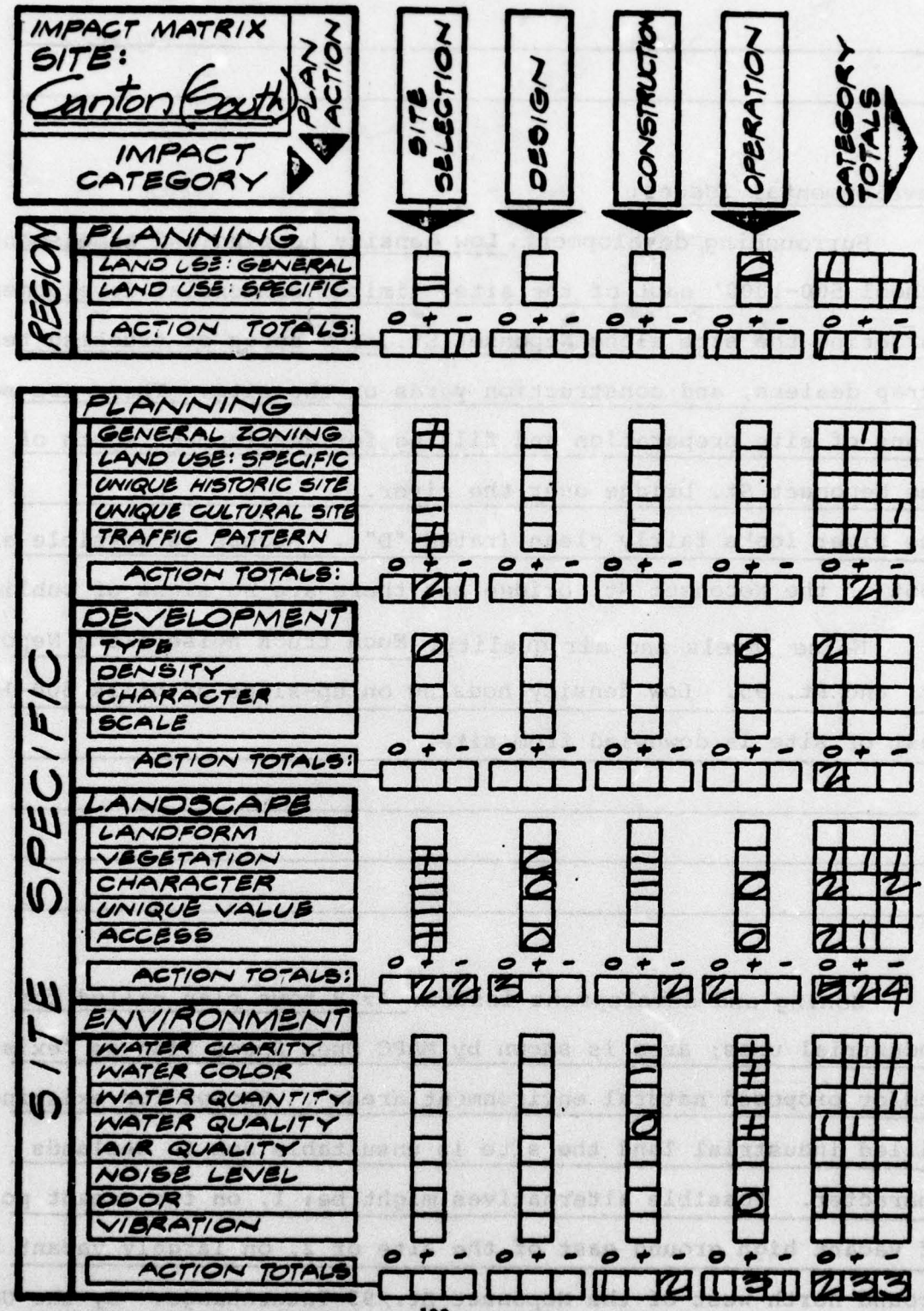
Developmental Issues:

Surrounding development. Low density housing and an elementary school 500-1000' east of the site; limited commercial development bordering the site along Neponset St., 6-8 acres of trucking terminal, scrap dealers, and construction yards on the site. There are some signs of site preparation and filling for development south of the Neponset St, bridge over the river.

The river looks fairly clean (rated "D"). Access is possible at the foot of the Neponset St. bridge but there are no signs of public use.

Noise levels and air quality. Much truck noise along Neponset St. and Rt. 95. Low density housing on up-slope of hills 500-1000' east of site is downwind from site.

Zoning and development issues. 1959 town plan called for industrial uses; area is shown by MAPC Open Space Plan as "existing and/or proposed natural environment areas". Except for existing filled industrial land the site is unsuitable due to wetlands character. Possible alternatives might be: 1. on two vacant portions of vacant high ground east of the site or 2. on largely vacant high ground north-west of the Neponset St./95 Interchange. By the USGS maps these vacant areas range from 18-42 acres.


IMPACT MATRIX
SITE: Canton South
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Chelmsford. USGS Quad Nashu, South.

Watershed Stony Brook. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						X
__X__ explicit by M & E						
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 2.1, 2020 4.5, 2050 8.4.

Plant/Facility; needed area(acres)

2000 2.3

Plant/Facility; areas served Westford, plus parts of Chelmsford and Littleton.

Site Specifics:

Terrain: flat; general "bottom land" appearance with some shallow depressions.

Vegetation: generally open field with fairly dense edge growth of second growth deciduous, trees and shrubs. Some evergreen along the back of the site.

Soils:

Special features: B. & M. railroad runs along one edge of site; Route 4 along another. Site is cut by power lines and Cold Springs Brook. Pumping Stations (water ?) are close to the back edge of the property.

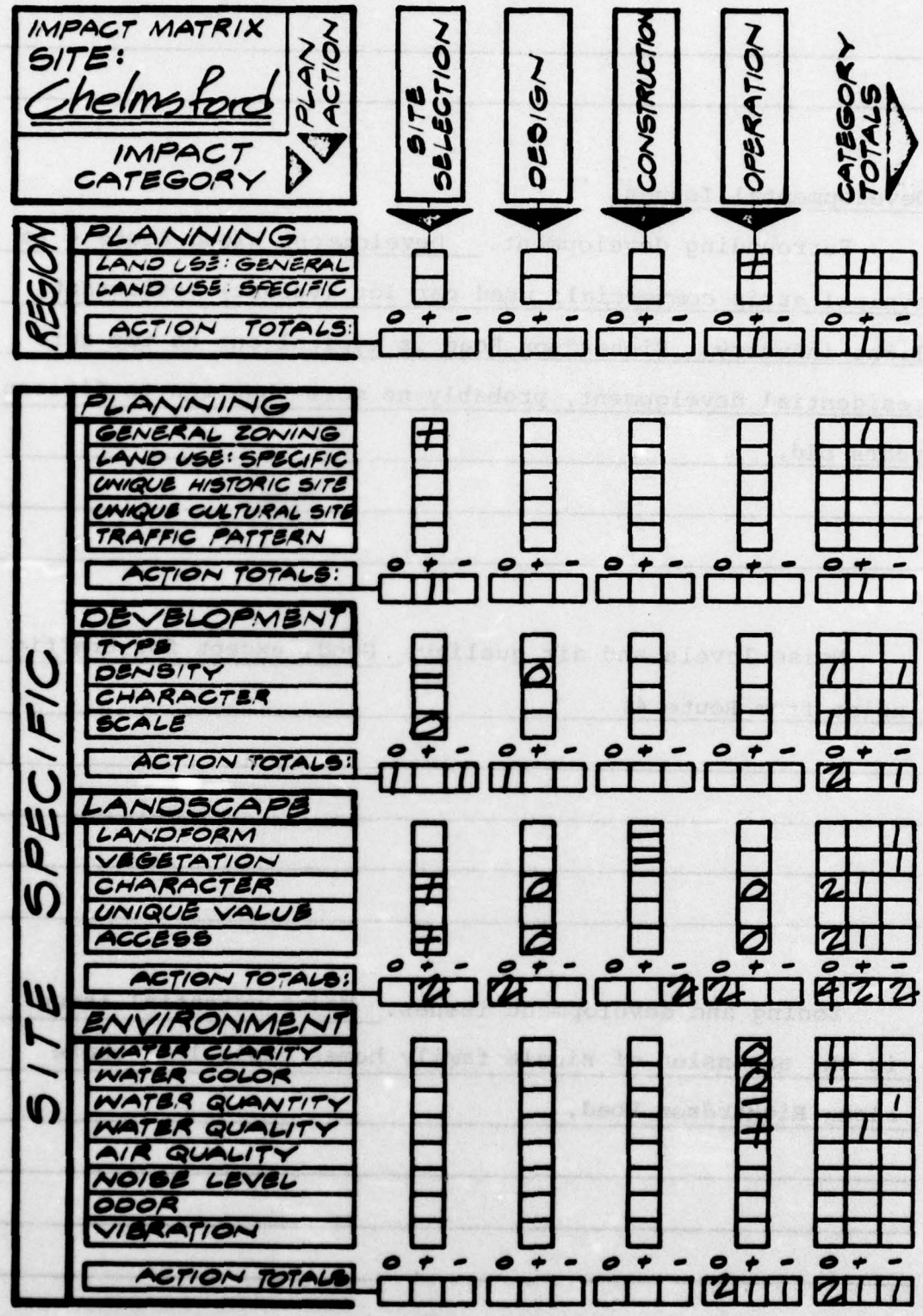
General site character: Open "farm field" with edge row vegetation. Site is on the edge of an urban, more dense development zone, but retains a more rural atmosphere.

Developmental Issues:

Surrounding development. Development along Route 4 is typical strip commercial; used car lot (vacant) restaurant, light industry. Richardson Road is typical one to two acre residential development, probably no more than ten to fifteen years old.

Noise levels and air quality. Good, except for traffic noise from Route 4.

Zoning and development issues. Major potential issue is the expansion of single family homes typical of those along Richardson Road.


IMPACT MATRIX
SITE:
Chelmsford
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Cohasset. USGS Quad Cohasset.

Watershed South Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						x
___ explicit by M & E						
___ explicit by others						
X interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

X Primary existing

X Secondary proposed

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 2.0, 2020 3.5, 2050 4.0.

Plant/Facility; needed area (acres)

2000 2.2

Plant/Facility; areas served Cohasset and part of Scituate

Site Specifics:

Terrain: Marsh surrounded by slight rise along roads on all sides. Small brook passes through marsh to harbor. water appears clear but that maybe from incoming tide . Access to marsh seems to require informal trespass.

Vegetation: grass, brush, few trees.

Special features : site contains existing plant; (1972-1973) is located between charming concentrated village and harbor; is presently screened by houses and trees at edge, but is visible from harbor area through houses and stores. Generally the marsh needs protection and definition, as do brooks entering it.

General site character: A pocket of marsh surrounded by development as above, much historic /cultural value.

Soils:

Developmental Issues:

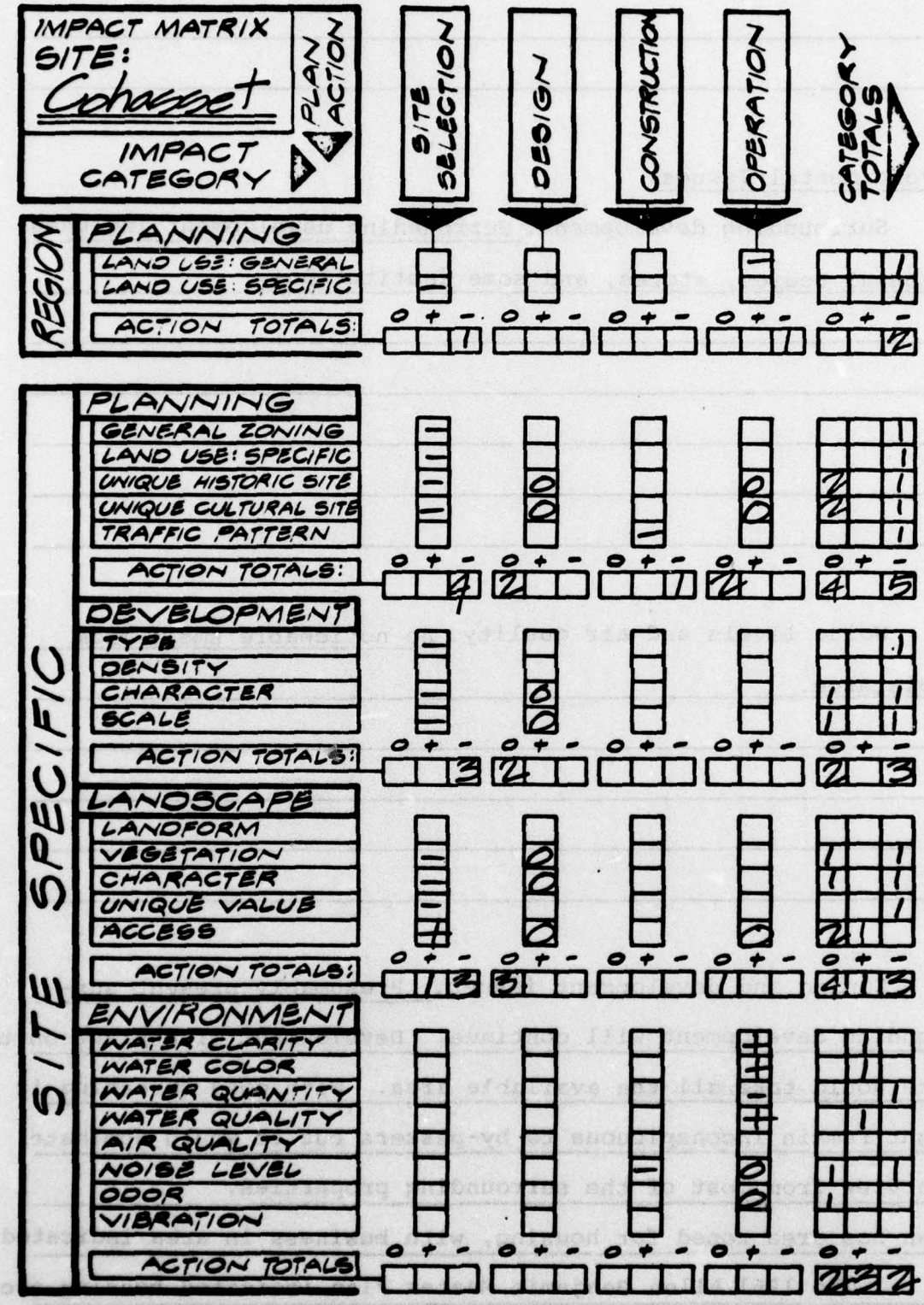
Surrounding development. Surrounding development includes colonial houses, stores, and some institutions.

Noise levels and air quality. no noticeable smell from a distance.

Zoning and development issues. Presumably present surrounding development will continue. Development of a plant on the site would take all the available area. With good screening it might remain inconspicuous to by-passers but it would dominate the view from most of the surrounding properties.

Town has area zoned for housing, with business in area indicated by

M&E The 1961 Allen Benjamin Master Plan indicated housing around the area with the marsh itself staying open.


IMPACT MATRIX
SITE: Cohasset
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Concord. USGS Quad Concord.

Watershed Concord River. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) Approx. 30 acres.

Plant/Facility type

___ Primary _____

X Secondary existing

X Advanced proposed

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 8.3, 2020 15, 2050 21.

Plant/Facility; needed area (acres)

2000 8.6

Plant/Facility; areas served Concord, Acton, Maynard, Littleton (part) and Boxborough (after 2000)

Site Specifics:

Terrain: This existing site is flat and partly built on filled land on the valley slope. Areas toward the river, drop off steeply. Other adjacent land is level or gently rolling.

Vegetation: Most of the actual site is open with adjacent areas well planted with white pine or left natural with a mixture of hard/soft woods.

Soils:

Special features: The Great Meadows National Wildlife Refuge is adjacent.

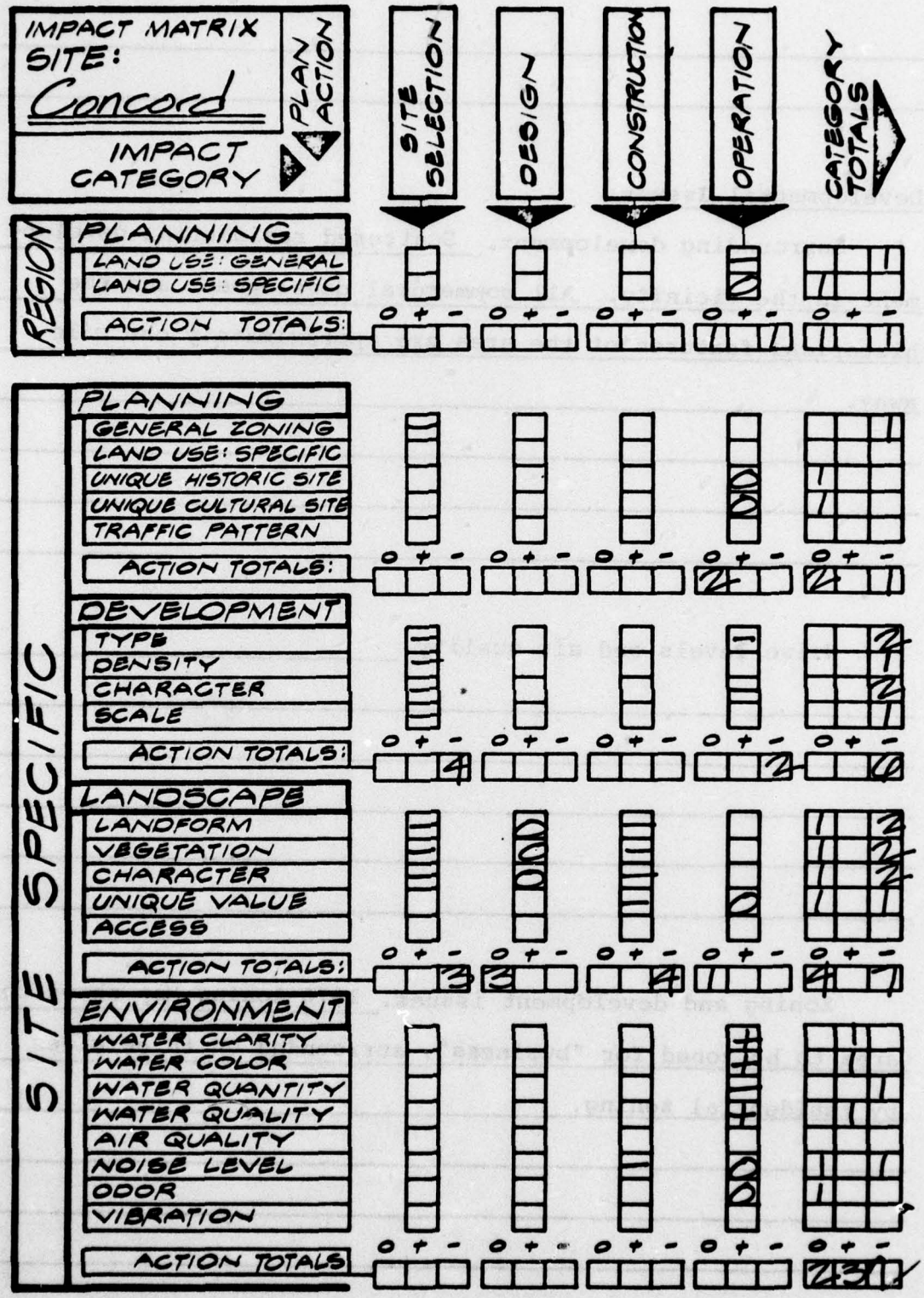
General site character: A basically rural character. Well forested and secluded with extensive high level views of the Concord River and the adjoining wilflife refuge.

Developmental Issues:

Surrounding development. Scattered residential development in the vicinity. All commercial development and the historical features of the area are approximately one mile away.

Noise levels and air quality.

Zoning and development issues. 1970 Zoning Map shows this area to be zoned for "business", surrounded on three sides by residential zoning.


IMPACT MATRIX
SITE:
Concord
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Dedham. USGS Quad Newton.

Watershed Charles River. Used in Concepts

Site Designation	1	2	3	4	5	All
		X		X	X	

____ existing facility

__X__ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx. 25 acres.

Plant/Facility type

____ Primary _____

__X__ Secondary proposed, Concept 5

__X__ Advanced proposed, Concepts 2 & 4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 (2)29(4)22, 2020 32, 2050 33.

Plant/Facility; needed area(acres)

2000 (2)24(4)19

Plant/Facility; areas served Concept 2: Wellesley, Natick, Needham, parts of Brookline, Dedham, Newton & Boston; Sherborn and Dover after 2000 Concept 4: Dover, Natick, Needham, Sherborn, Wellesley & part of Dedham

Site Specifics:

Terrain: Basically flat but rising at approx. 3% grade. Rough & lumpy; typical of a land fill area.

Vegetation: Generally non existant. However, adjacent residential areas are well treed with maple, oak and elm.

Soils:

Special features: Mother Brook borders the site and should be preserved. Charles River marshland should be considered as a dominate landscape feature.

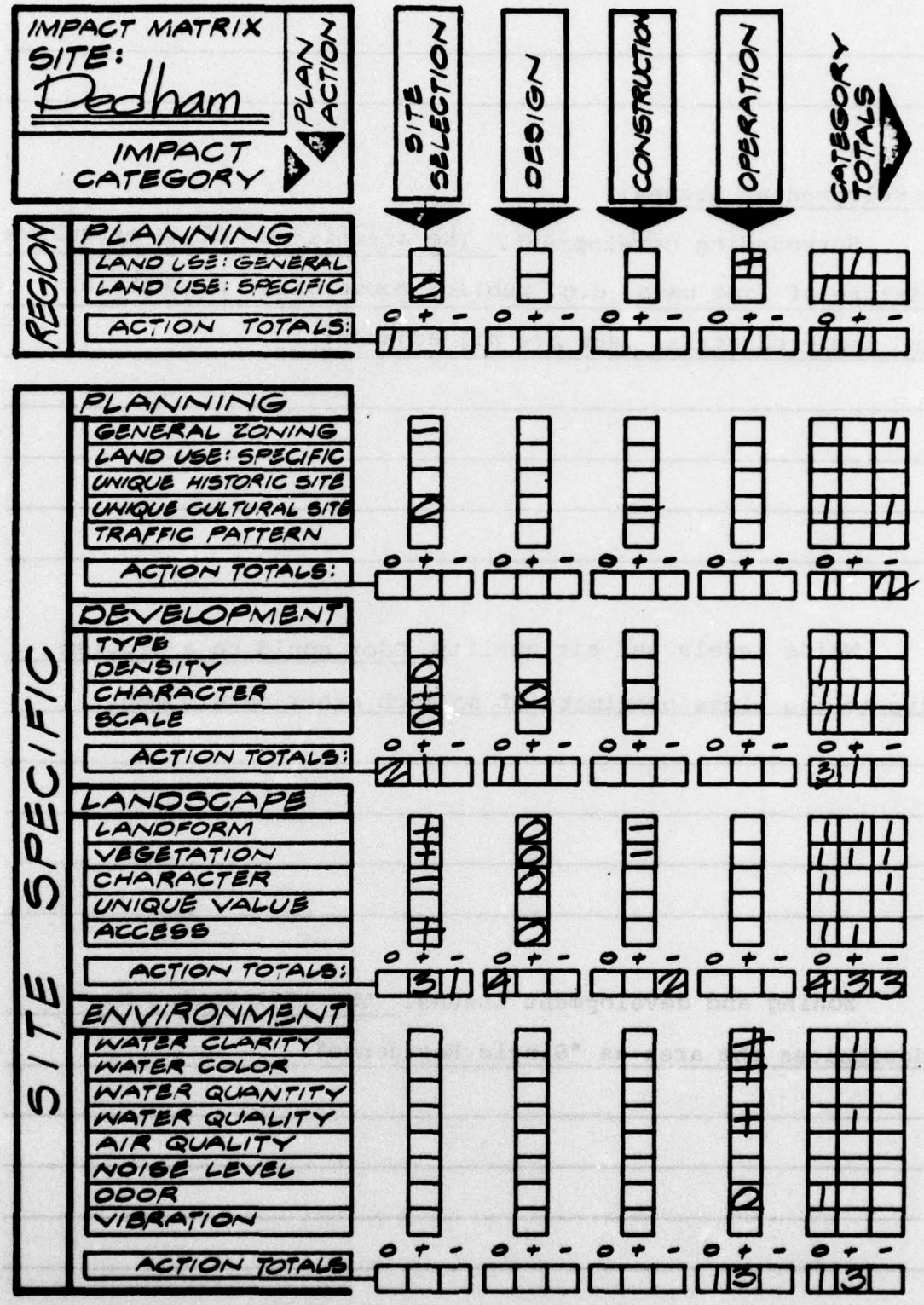
General site character: The site is in the middle of a highly urbanized strip along Rt. 1. The large open nearly rural space of the near-by Charles River provides a sharp contrast. Residential areas to the no-th and east are well treed.

Developmental Issues:

Surrounding development. The area is one of an extensive mixture of land uses, e.g. public, commercial, residential and semi-industrial uses are all adjacent.

Noise levels and air quality. Odor could be a problem due to the close proximity of so much other development.

Zoning and development issues. The 1971 Zoning Map designates the area as "Single Residence".


IMPACT MATRIX
SITE: Dedham
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Deer Island. USGS Quad Hull.

Watershed Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

x existing facility

___ explicit by M & E

___ explicit by others

___ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

X Primary existing

X Secondary proposed

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 Concept 1; 380. Concept 2; 345. Concept 3; 380. Concept 4; 285.

Plant/Facility; needed area (acres)

2000 Concept 1; 98. Concept 2; 92. Concept 3; 98. Concept 4; 81

Plant/Facility; areas served Portions of the M.D.C. sewer district; varies from concept to concept.

Site Specifics:

Terrain: Generally flat with one major, very prominent hill.

Vegetation: Very few trees; mostly grasses.

Soils:

Special features: The site is an island in Boston Harbor. There is a wide range of existing uses; correctional, military, municipal and recreational.

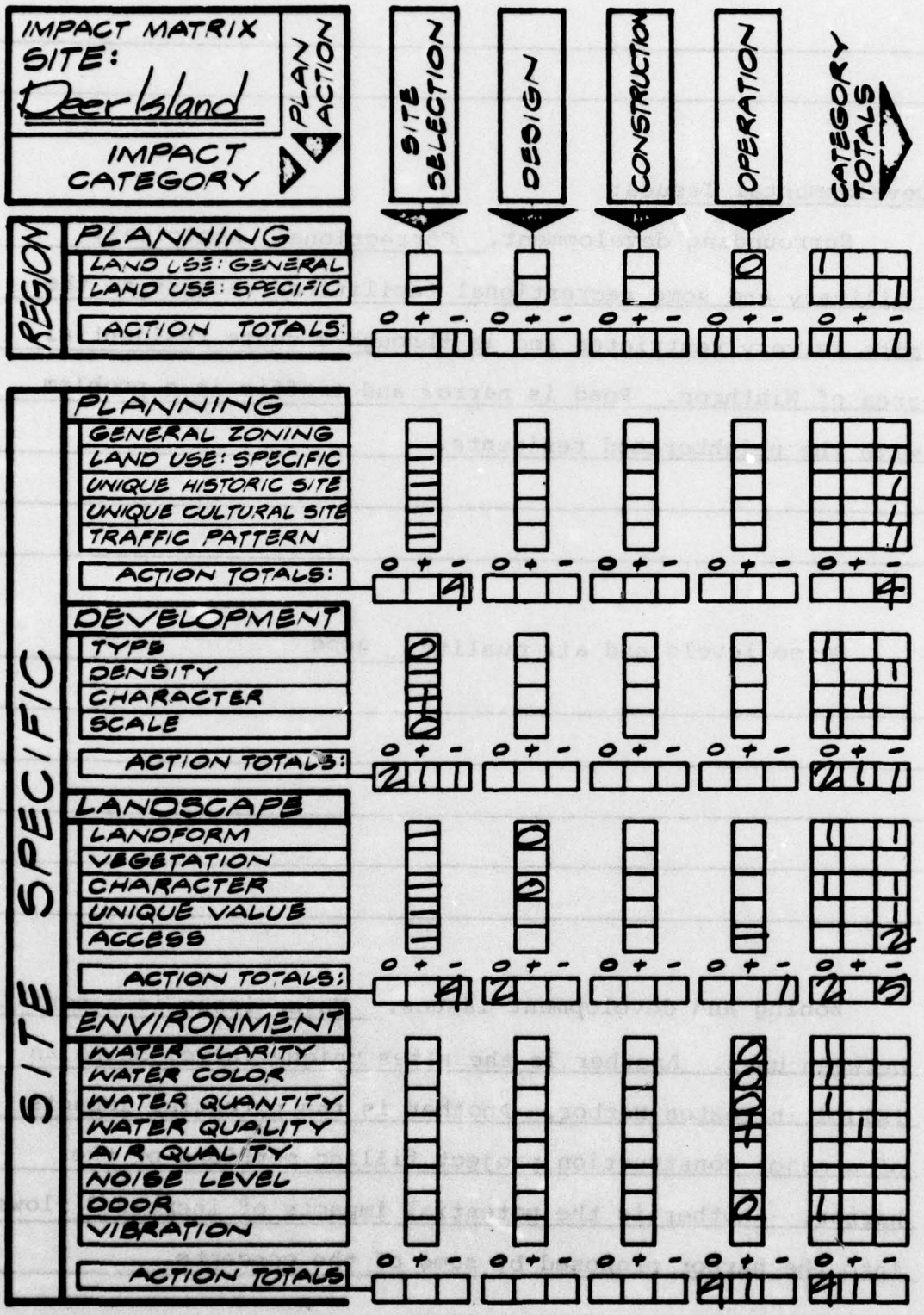
General site character: Most impressive feature of the site is its location and views. Site appears to be a confusing mixture of non-conforming and somewhat non-compatible uses. The results of time, old age, neglect and vandilism. are very evident and distract from the overall site.

Developmental Issues:

Surrounding development. Correctional, municipal, military and some recreational facilities. Access to the site is very restricted and is through a dense residential area of Winthrop. Road is narrow and traffic is a problem with the neighborhood residents.

Noise levels and air quality. good

Zoning and development issues. Major issue is a conflict between uses. Another is the sites unique valve, being an island in Boston Harbor. Another is the potential impacts of a major construction project filling portions of the harbor. Another is the potential impacts of increased flows into the harbor proposed by some of the concepts.


IMPACT MATRIX
SITE:
Deer Island
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Essex. USGS Quad Ipswich.

Watershed North Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						X
____ explicit by M & E						
X explicit by others (W. & H.)						
____ interpreted by W & H.						

Area available (if limited and known) Approx. 7.0 acres.

Plant/Facility type

____ Primary _____

X Secondary proposed (See note "A", below)

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 0.4, 2020 1.1, 2050 1.9.

Plant/Facility; needed area(acres)

2000 1.5

Plant/Facility; areas served Essex

"A" Plant is designed & approved and is waiting for funding.

Site Specifics:

Terrain: Flat to rolling.

Vegetation: Very thin mostly low shrubs with second growth deciduous along the edges of what were probably cultivated fields.

Soils:

Special features: Site is high ground on the edge of the tidal marsh. Site is open, very visual and has commanding views all around.

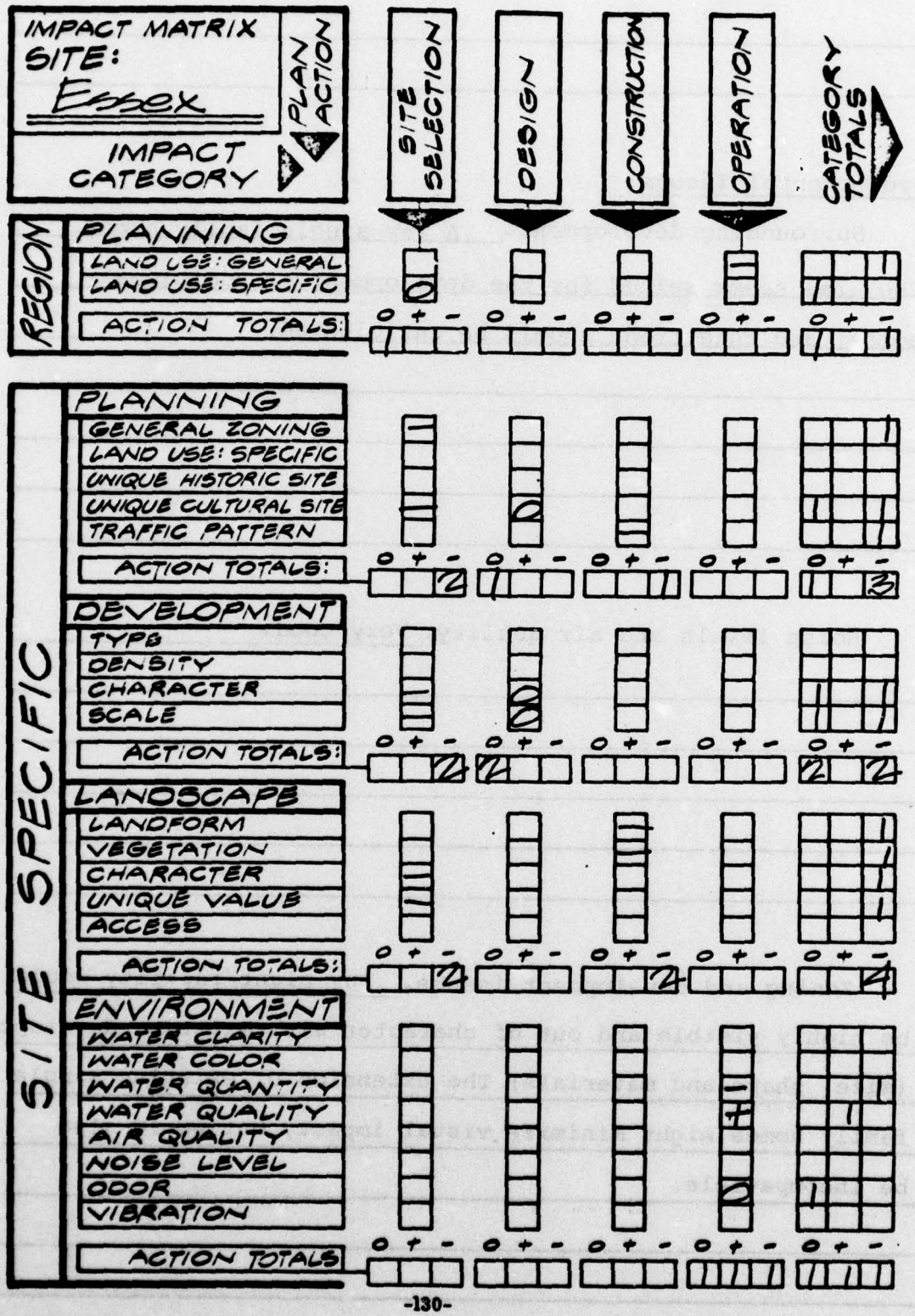
General site character: a combination of somewhat open farm/field and salt marsh.

Developmental Issues:

Surrounding development. A few single family homes. The area seems suited for the development of additional homes, and this trend should be anticipated.

Noise levels and air quality. Very good.

Zoning and development issues. Any plant/facility would be highly visible and out of character with existing development (size, shape and materials) The extension of existing single family homes might minimize visual impact, but would also be incompatible.


IMPACT MATRIX
SITE:
Essex
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Framingham. USGS Quad Framingham.

Watershed Sudbury River. Used in Concepts

Site Designation	1	2	3	4	5	All
		X		X		

____ existing facility

X ____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

____ Secondary _____

X ____ Advanced proposed, Concepts 2&4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 19, 2020 23, 2050 27.

Plant/Facility; needed area (acres)

2000 17

Plant/Facility; areas served Ashland, Framingham, Hopkinton, Southborough.

All flows go to Dedham under Concept 5

Site Specifics:

Terrain: Sites are basically flat with slight undulations typical of excavated gravel pit areas. NW pit is on two distinct levels and SW site is very rough. NE site is basically flat at river level (perhaps test site).

Vegetation: Non-existant or insignificant on actual sites. Important vegetation is on perimeters, i.e. pine groves, mixed hard/soft woods and marshland with maple, poplar, willow along the river.

Soils:

Special features: M.D.C. Aquaduct runs adjacent to the sites.

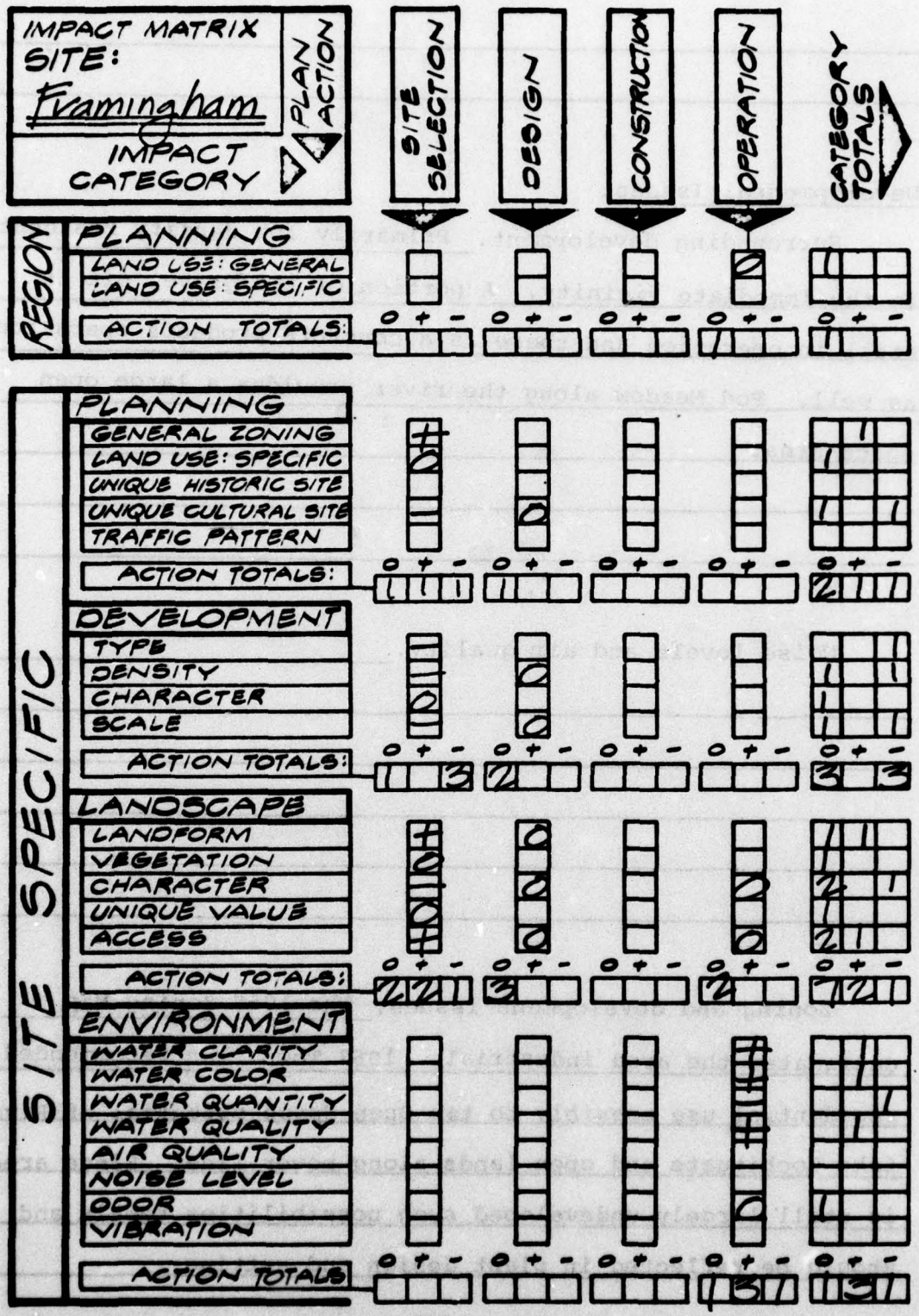
General site character: Very open due to excavation but still somewhat secluded by topography and vegetation. Still essentially a rural character. River & marshland provide large open space. Other immediate areas remain undeveloped or large lot residential with tree cover retained.

Developmental Issues:

Surrounding development. Primarily low density residential in the immediate vicinity. A portion of the gravel pit is still in operation and there is a concrete products operation as well. Pod Meadow along the river provides a large open space area.

Noise levels and air quality.

Zoning and development issues. The 1967 Zoning Map designates the area industrial. 1967 Town Plan recommended residential use possibly to tap Open Space potential of River, Lake Cochituate and open lands along power line. Since area is still largely undeveloped such possibilities remain and should be reflected in plant design and setting.


IMPACT MATRIX
SITE:
Framingham
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Glouscester, 133. USGS Quad Gloucester.

Watershed North Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

____ existing facility

____ explicit by M & E

__X__ explicit by others (W. & H.)

____ interpreted by W & H.

Area available (if limited and known) Approx. 8 acres.

Plant/Facility type

____ Primary _____

__X__ Secondary proposed _____

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 7.5, 2020 _____, 2050 _____.

Plant/Facility; needed area(acres)

2000 8

Plant/Facility; areas served Gloucester Only.

Plant construction expected to begin by June, 1975.

Site Specifics:

Terrain: Very flat. Site is mostly tidal marsh.

Vegetation: Grasses. Rear edge of site is foot of very steep hill. Hill is heavily wooded with deciduous material.

Soils:

Special features: General character and visual nature of a tidal marsh. With exception to hill at the rear of the site, the entire site is very open and exposed to all major approach avenues.

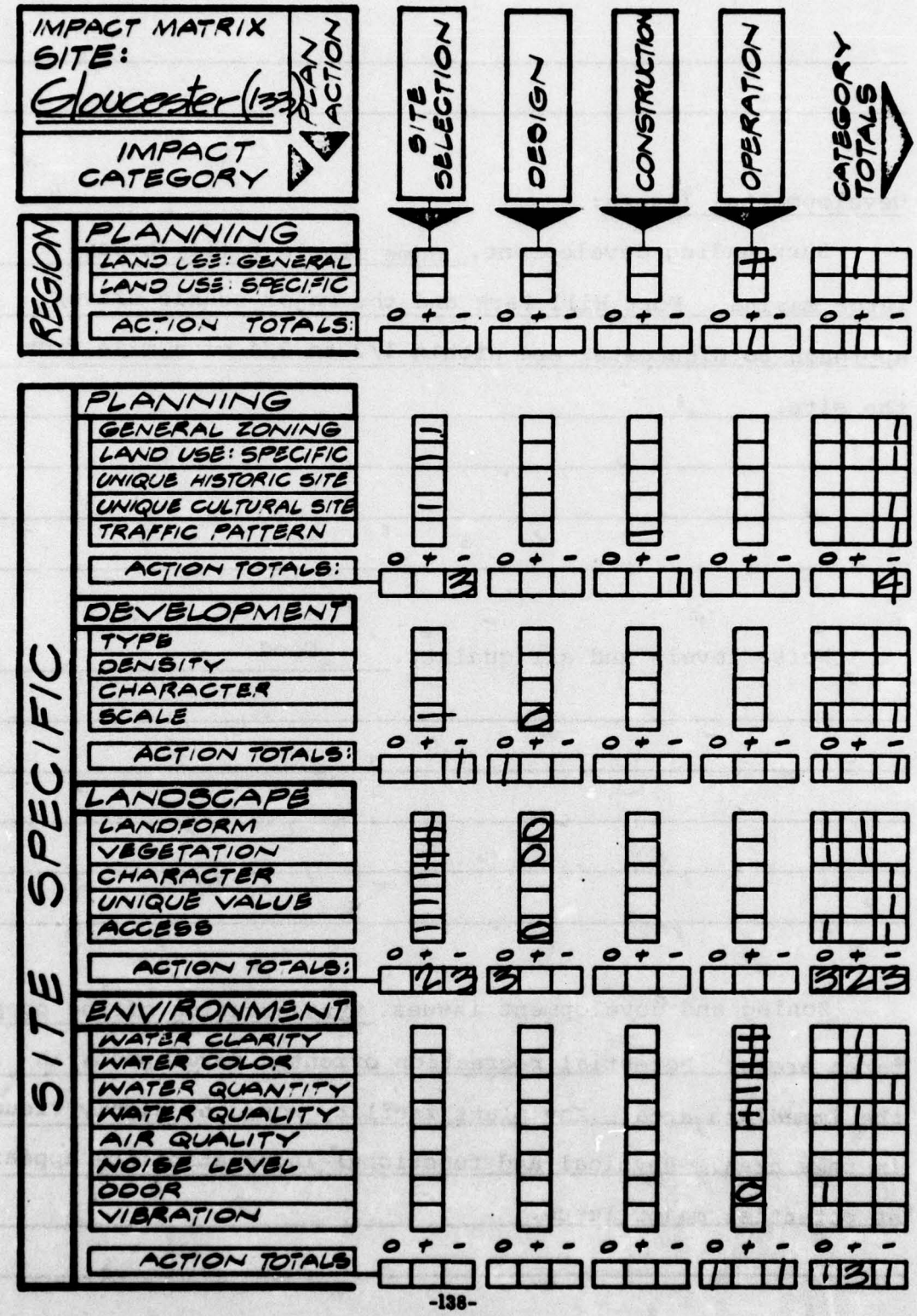
General site character: Open tidal marsh, contrasted to wooded hill as a backdrop/setting.

Developmental Issues:

Surrounding development. Some single family homes, a large marina. Fort Hill Park and the major scenic drive/ approach to Gloucester are within 1/2 to 3/4 of a mile from the site.

Noise levels and air quality. Good

Zoning and development issues. Preservation of the open marsh areas. Potential recreation oriented development in the immediate area. Any plant facility would be highly visual in this area. Physical and functional incompatibility appears as potential major issue.


IMPACT MATRIX
SITE: Gloucester (133)
IMPACT CATEGORY
PLAN ACTION
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location (Lanesville) Gloucester. USGS Quad Gloucester.

Watershed North Coastar. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						X

____ explicit by M & E

__X__ explicit by others (W. & H.)

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

__X__ Secondary proposed

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 0.07, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 2.0

Plant/Facility; areas served Lanesville section of Gloucester

Site Specifics:

Terrain: Man made (in part), flat, sharp edge/material constructions and contrasts.

Vegetation: Low shrubs, grasses.

Soils:

Special features: Very large & impressive granite dikes & breakwaters/walls and the small inlet and cove. Area used for protected anchorage by local fisherman.

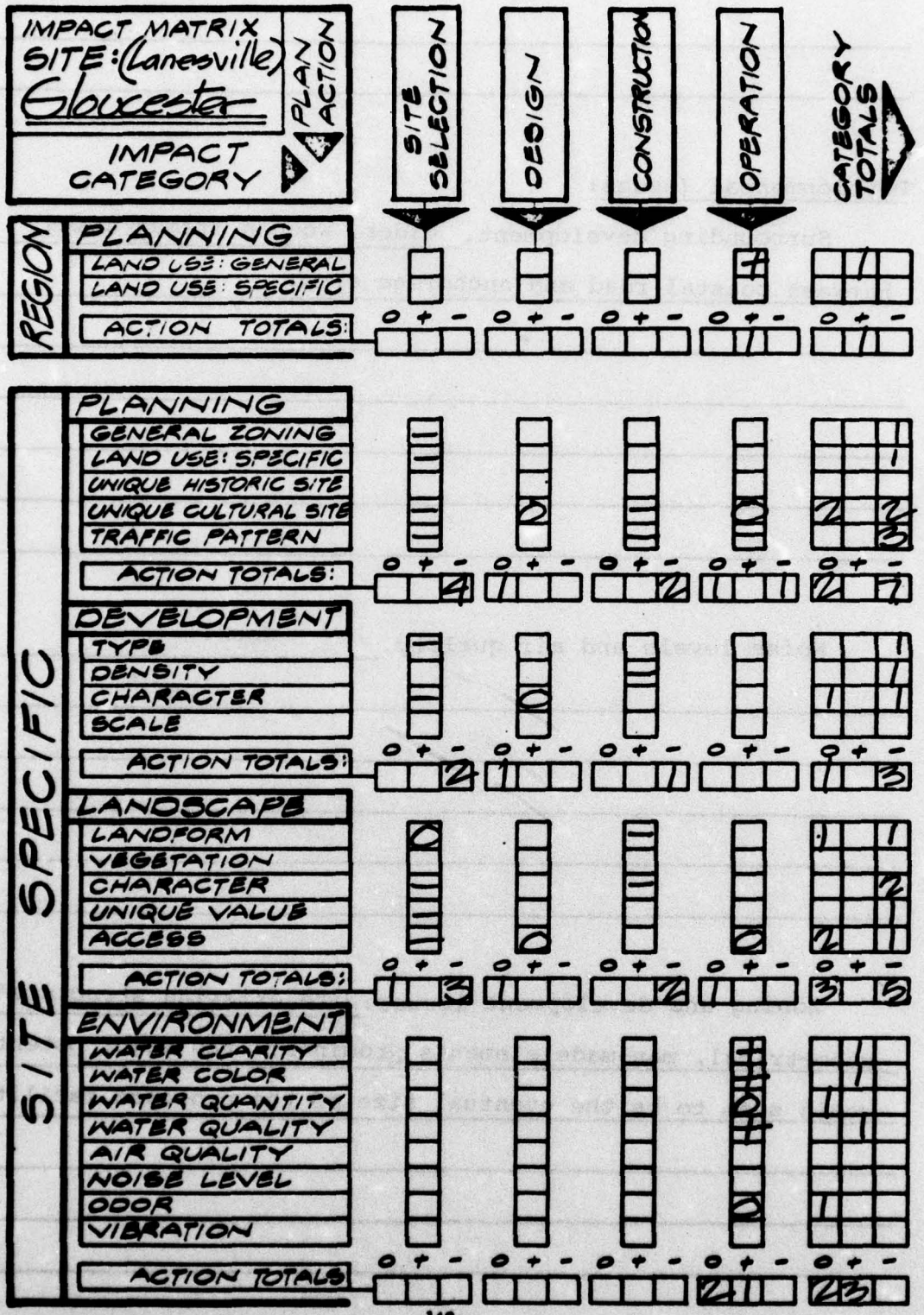
General site character: A very defined area, somewhat "rundown". Overall impression is natural, but structured, man-made elements are imposing. Area is unique and can be classified as scenic and picturesque.

Developmental Issues:

Surrounding development. Older, wooden framed homes between coastal road and anchorage area.

Noise levels and air quality. Good.

Zoning and development issues. With existing structured, geometrical, man-made elements prominent, the major potential would seem to be the eventual size of the proposed facility.


IMPACT MATRIX
SITE: (Lanesville) Gloucester
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Gloucester (Magnolia). USGS Quad Gloucester .

Watershed North Coastal . Used in Concepts

Site Designation

1	2	3	4	5	All
					X

____ existing facility

____ explicit by M & E

__X__ explicit by others (W. & H. see note "A", below)

____ interpreted by W & H.

Area available (if limited and known) See note "A" .

Plant/Facility type

____ Primary _____

__X__ Secondary proposed

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 0.4 , 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 _____

Plant/Facility; areas served The Magnolia section of Gloucester and possibly part of Manchester. Note "A": Consideration is now being given to moving the site inland to the West Pond area and including some flow from portions of Manchester.

Site Specifics:

Terrain: Rocky seacoast to steep hills immediately inland.

Vegetation: A mixture of deciduous and evergreens, most of which are prominent, mature trees.

Soils:

Special features: The entire area is one of the most scenic sections of the northshore.

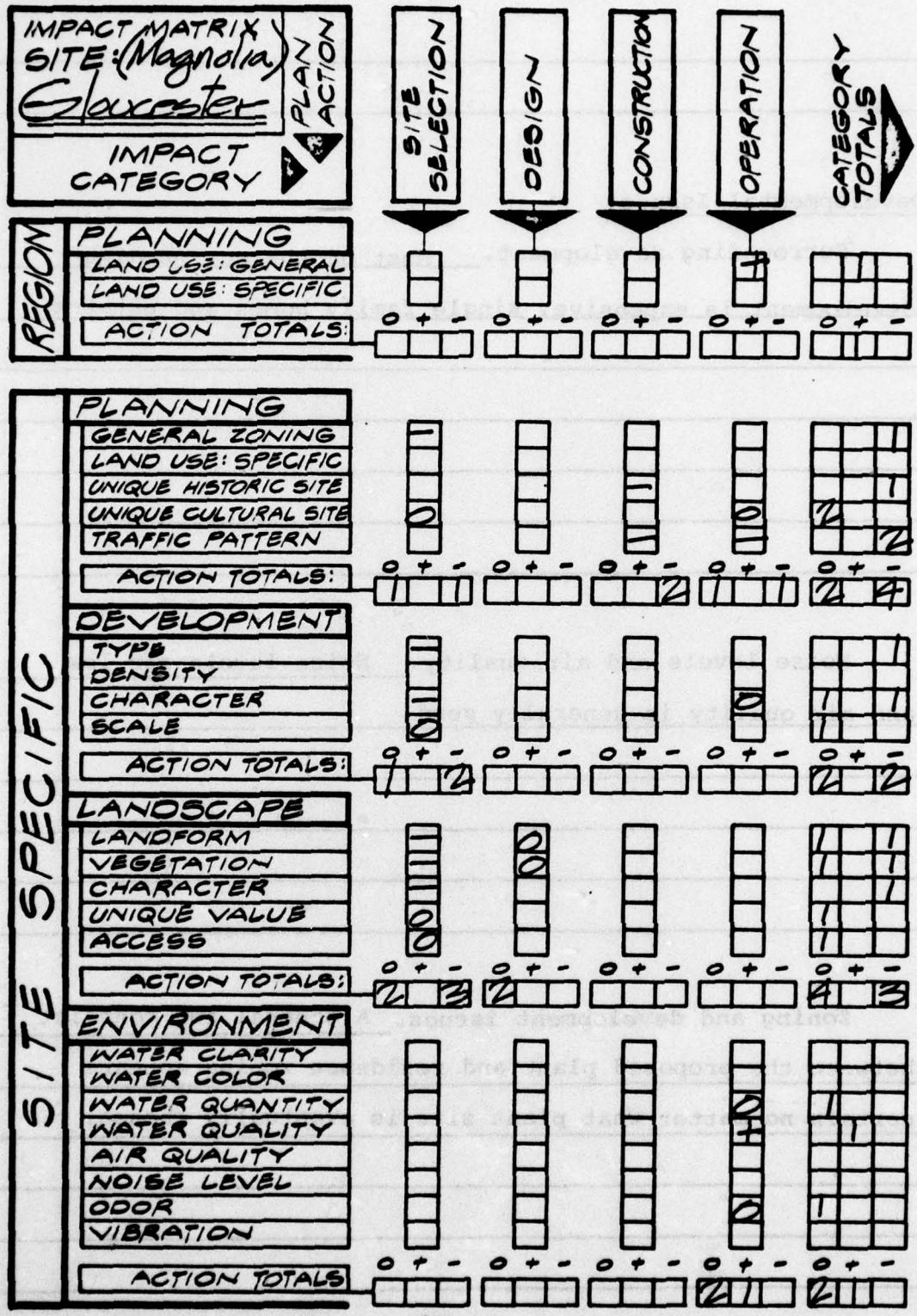
General site character: A range from rocky coast line to wooded hills. The homes are impressive and generally blend with, and compliment, the natural elements of the area.

Developmental Issues:

Surrounding development. Most of the surrounding development is expensive, single family homes and estates.

Noise levels and air quality. Noise levels are low and air quality is generally good.

Zoning and development issues. A general and conflict between the proposed plant and residence zoning appears certain no matter what plant site is eventually chosen.


IMPACT MATRIX
SITE: (Magnolia) Gloucester
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Hamilton. USGS Quad Ipswich.

Watershed Ipswich River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						
__X__ explicit by M & E						X
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 1.4, 2020 5.9, 2050 11.0.

Plant/Facility; needed area (acres)

2000 2.5

Plant/Facility; areas served Hamilton, Topsfield plus Boxford & Wenham, after 2,000

Site Specifics:

Terrain: Rolling; site appears to be a small depression.

Vegetation: Fairly dense; generally mature deciduous with a few evergreens.

Soils:

Special features: Surrounding development; exclusive single family homes and "small estates".

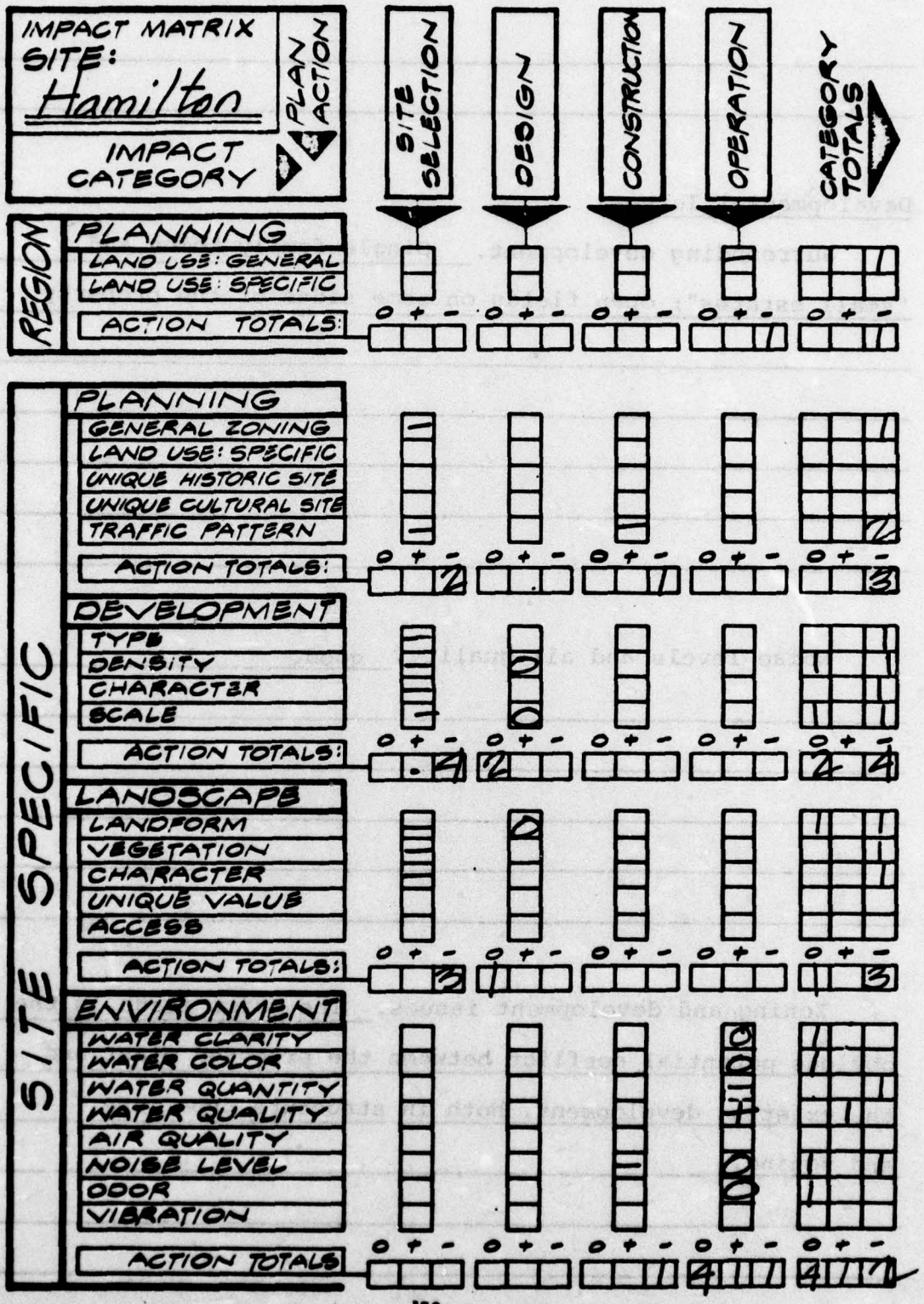
General site character: Rural, country atmosphere.

Developmental Issues:

Surrounding development. Single family homes and "small estates"; open fields on some sides of the property.

Noise levels and air quality. good.

Zoning and development issues. The major issue is the obvious potential conflict between the proposed plant and the existing development, both in structure type, use, and zoning.


IMPACT MATRIX
SITE: Hamilton
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Hopedale (Milford STP) USGS Quad Milford.

Watershed Charles River. Used in Concepts

Site Designation

1	2	3	4	5	All
X	X		X	X	

X existing facility

____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) est 25+ acres;.

Plant/Facility type

____ Primary _____

X Secondary existing trickling filler plant

X Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 3.7, 2020 4.3, 2050 4.5.

Plant/Facility; needed area (acres)

2000 4.6

Plant/Facility; areas served Milford. Existing plant is reportedly beyond capacity, and under court order to stop dumping sewage onto river.

Site Specifics:

Terrain: low, Charles River flood plain; marshy along river.

Vegetation: Marshy (very wet pasture) along river, grass and shrubs, mixed low hardwood around whole site plus misc. shrubs, grapes etc. Old treatment lagoon area is open except for some brush.

Soils: Sandy above river, dark and fine along river.

Special features: extensive old lagoon area. Adjoining solid waste disposal company has an old sand pit (?) and a small landfill crowding adjoining wetland area, landscape east of river is agricultural - residential in character and very attractive.

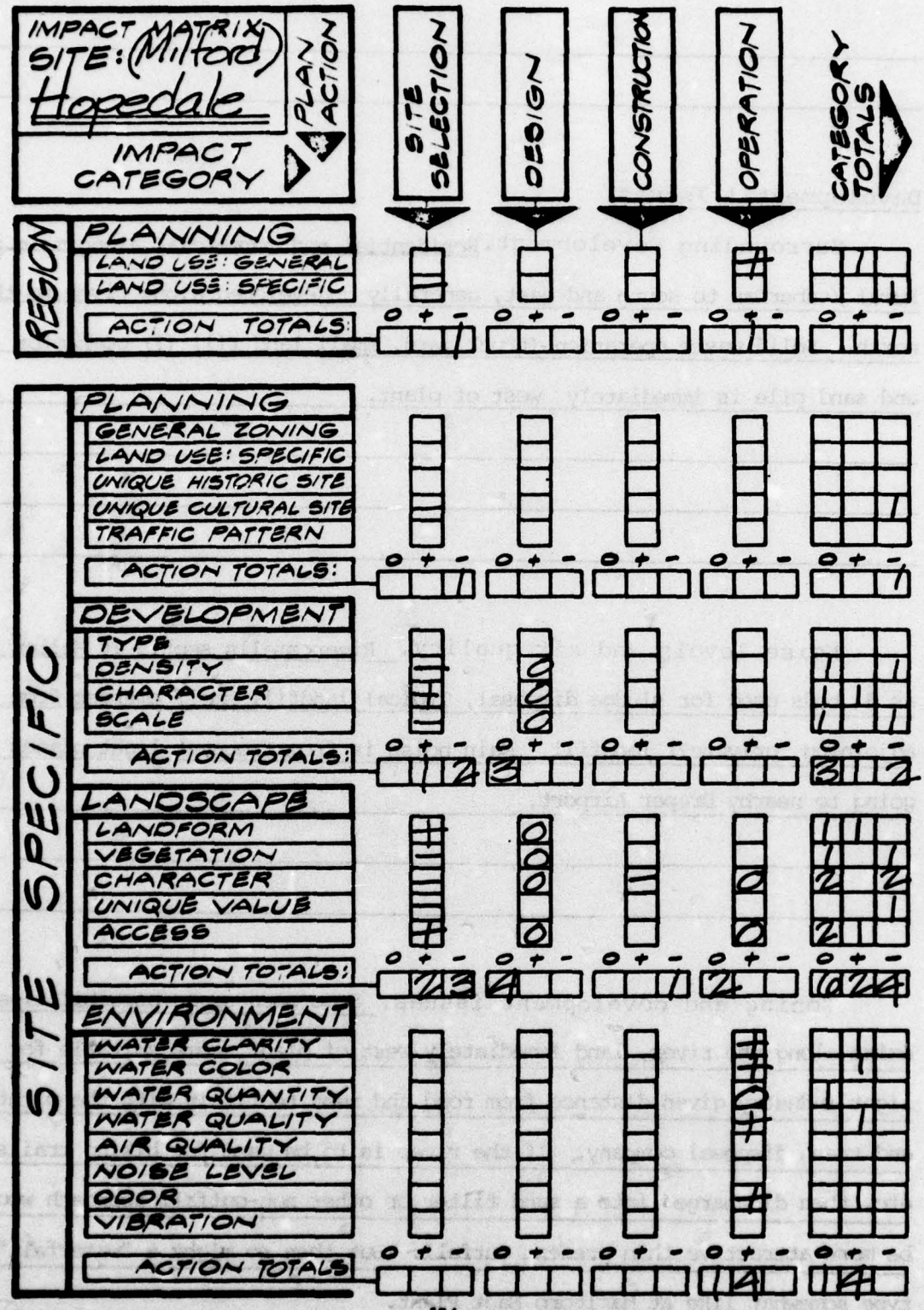
General site character: Wooded and pasture flood plain, backing onto rural/suburban development. The river wanders. It has access from local (Mellon St.) but there is little easy public access though contact is possible at bridges and at outfall.

Developmental Issues:

Surrounding development. Residential and commercial along main road. Rural /suburban to south and east, generally undeveloped along river to the north. Solid waste operation (truck yard, small land fill (?) compactor and sand pile is immediately west of plant.

Noise levels and air quality. River smells septic at Mellon St. as do beds used for sludge disposal, Typical landfill smell emerges from adjoining (private?) landfill. Main noise is from frequent light planes going to nearby Draper Airport.

Zoning and development issues. Some open space possibilities exist along the river, land immediately west of plant seems suitable for light industry given distance from road and need to fit in with the plant and trash disposal company. If the river is to be used for hiking trails etc. then discharge into a sand filter or other non-outfall approach would be more attractive than present outfall. (But then so might a "waterfall" type somewhat like at Marlboro East Plant.


IMPACT MATRIX
SITE: (Milford) Hopedale
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Hudson. USGS Quad Hudson.

Watershed Assabet. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) 20-24.

Plant/Facility type

___ Primary _____

X Secondary existing

X Advanced proposed

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 3.9, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 4.8

Plant/Facility; areas served Hudson. After 2000, combined with Bolton and Stow.

Site Specifics:

Terrain: Level flood plain of Assabet River sloping up to east and south, and down to river and marshes on M.W. River access is fair by road and sewer easement to outfall, water is slow and dusty.

Vegetation: Young maple in sewer beds, mature pines and some hardwoods in surrounding area.

Soils:

Special features: Extensive open area from old sewer beds, partially reclaimed for DPW yard.

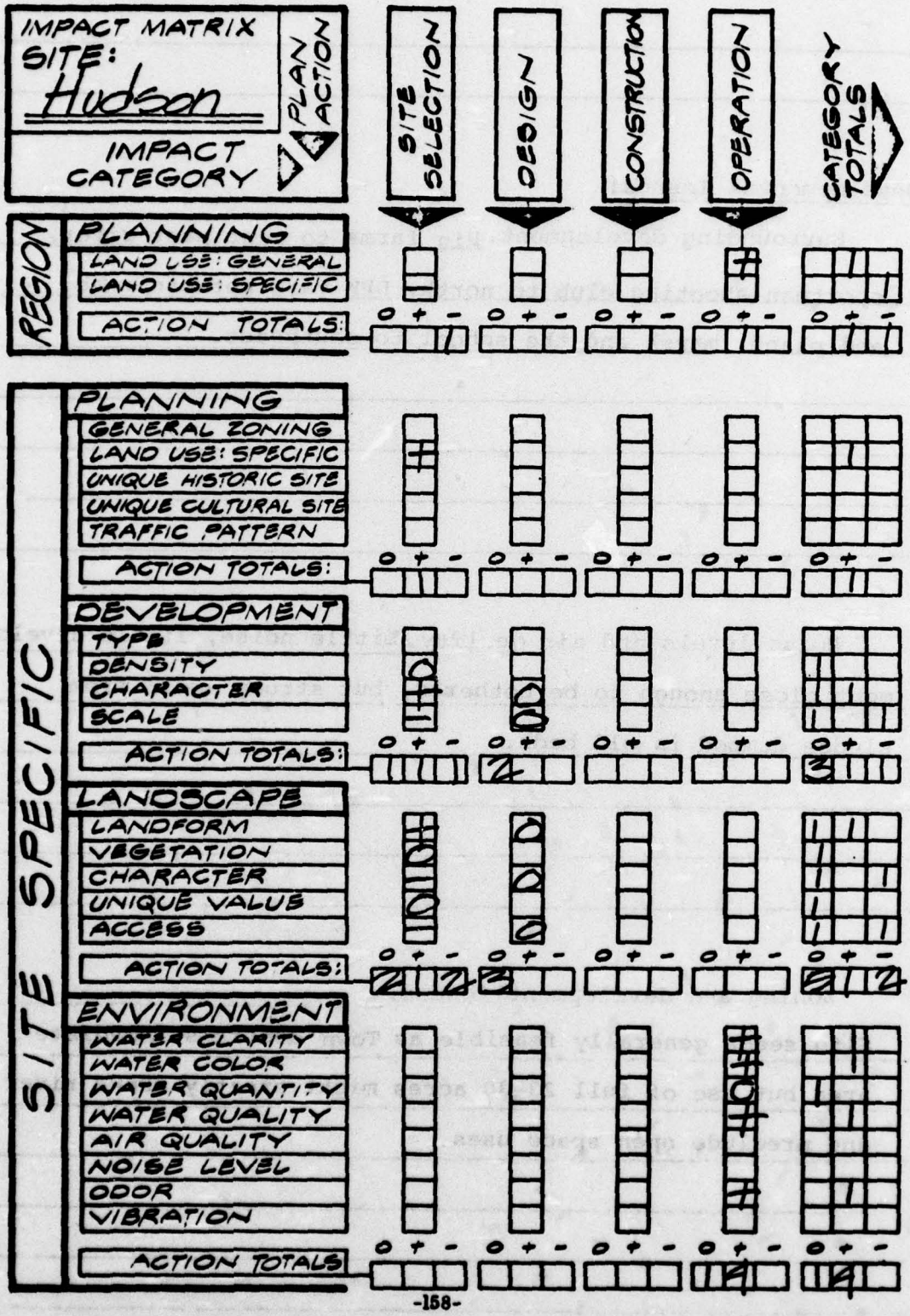
General site character: Secluded, wooded, but very close to potential open space area along river.

Developmental Issues:

Surrounding development. Pig farms to west past river, sportman shooting club to north, DPW yard between road and plant, marsh and the school to southeast.

Noise levels and air quality. Little noise, little development close enough to be bothered, but strong smell from sludge dumped in old beds.

Zoning and development issues. Site seems generally feasible as Town controls immediate area but use of full 23-30 acres might greatly crowd river and preclude open space uses.


IMPACT MATRIX
SITE: Hudson
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Hull. USGS Quad Hull.

Watershed South Coastol. Used in Concepts

Site Designation

	1	2	3	4	5	All
____ existing facility (under design)						x

____ explicit by M & E

__X__ explicit by others

____ interpreted by W & H.

Area available (if limited and known) 4-6 acres.

Plant/Facility type

____ Primary _____

__X__ Secondary proposed

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 1.0, 2020 1.0, 2050 1.2.

Plant/Facility; needed area (acres)

2000 1.5

Plant/Facility; areas served Hull

Site Specifics:

Terrain: low, semi-marsh between cemetary and hill, and road running along shore. One road runs along ocean, the other along Hull Bay.

Vegetation: grass and brush with trees along cemetery edge.

Soils:

Special features: very prominent position between two shore roads and below a hill.

General site character: Low, visible surrounded by residences and open space use. Plant would be far less evident if control building and any other high elements were oriented to hillside, but that might conflict more with view from cemetery.

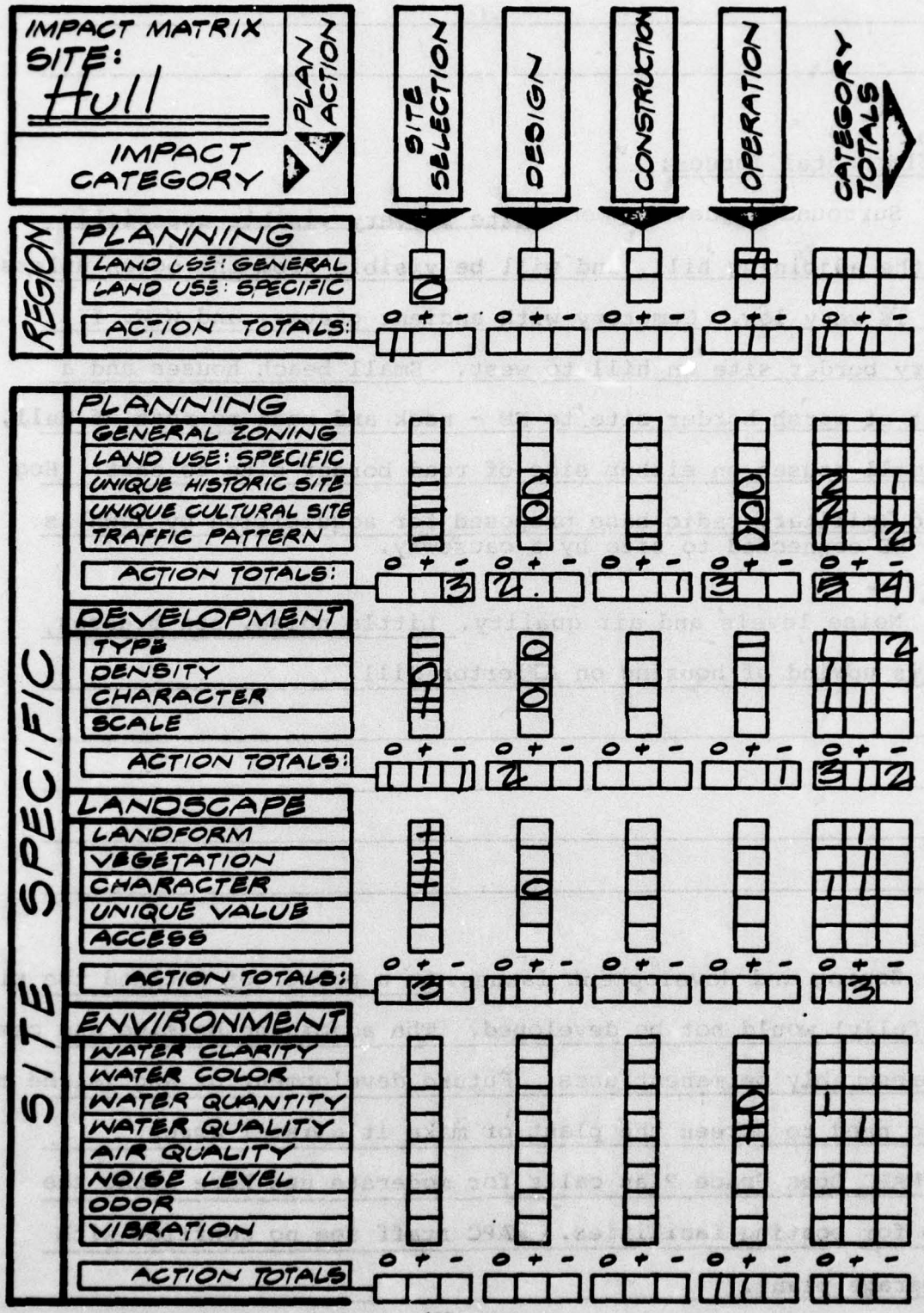
Developmental Issues:

Surrounding development. Site is very visible especially from the adjoining hill, and will be visible from the ocean unless plant is very low. Cemetery with ancient graves, and W.W. II Battery border site on hill to west. Small beach houses and a pocket of marsh border site to NW - neck and road to rest of Hull, and small houses on either side of road border site to east. Hog Island (military radio base proposed for acquisition by town) is 1000' SE connected to site by a causeway.

Noise levels and air quality. Little noise, sea breezes, site is upwind of housing on Allerton Hill.

Zoning and development issues. As a pocket of wetland the site (hopefully) would not be developed. The adjoining housing and cemetary are presumably permanent uses. Future development of Hog Island may add to need to screen the plant or make it a visual asset.

MAPC Open Space Plan calls for moderate use here along the shore for boating facilities. MAPC staff see no conflict with a sewerage plant.


IMPACT MATRIX
SITE: Hull
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Ipswich. USGS Quad Ipswich.

Watershed Ipswich River. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

X Primary Existing

X Secondary Under Construction

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 2.1, 2020 3.3, 2050 4.2.

Plant/Facility; needed area(acres)

2000 2.6

Plant/Facility; areas served Ipswich

Site Specifics:

Terrain: Rolling to flat site has no major land forms, although it is fairly close to the edge of the salt marsh.

Vegetation: Mostly second growth deciduous, with a few evergreens.

Soils: Mostly clay.

Special features: The site is close to the edge of a major salt water marsh, but vegetation blocks any views to, or from, the marsh. Expansion of the existing plant has just begun.

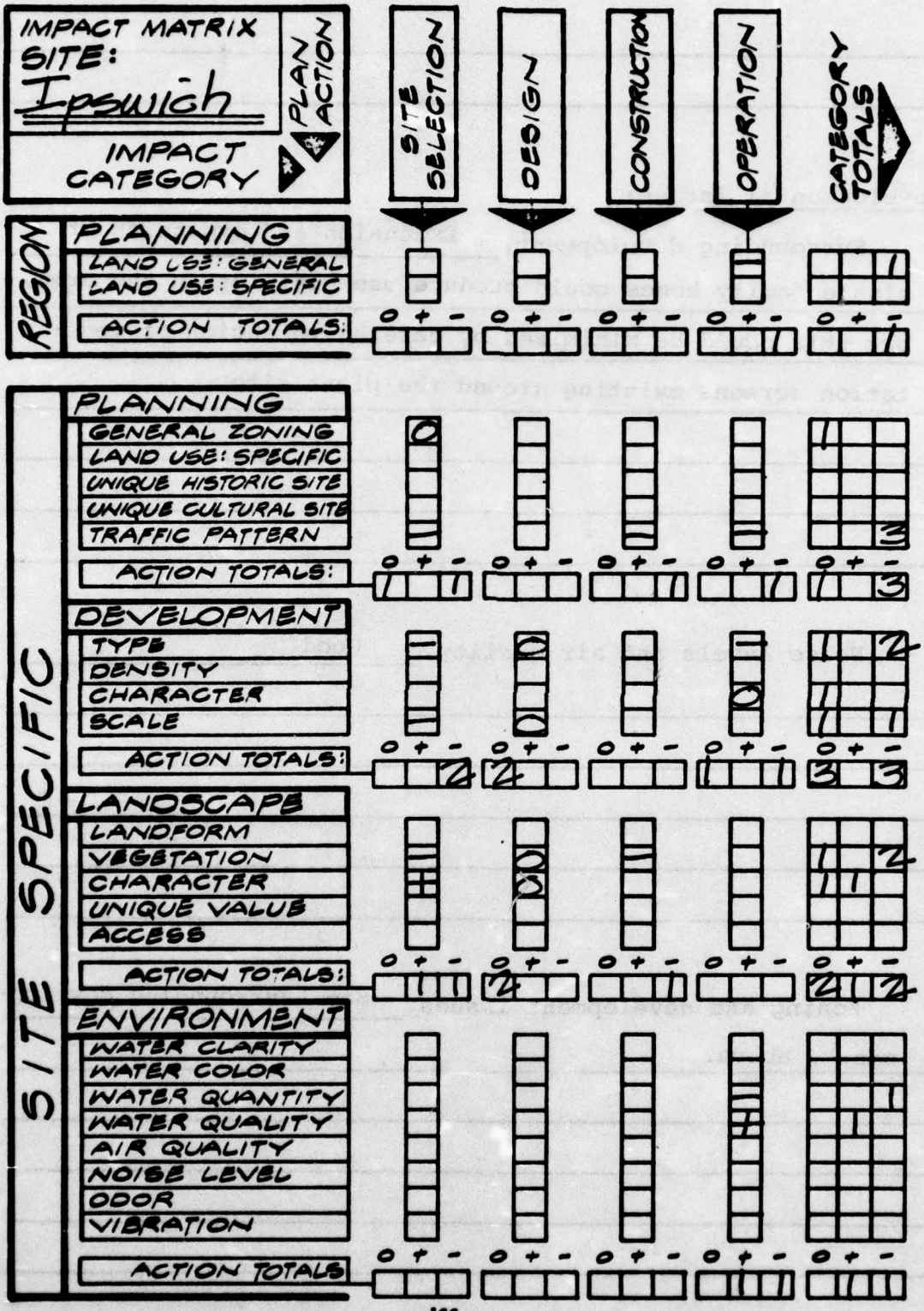
General site character: Wooded, the site is at the very end of a secondary residential road. Currently, there is adequate separation between the plant and the single family homes.

Developmental Issues:

Surrounding development. Extension and expansion of single family homes could produce use conflict in the area, but this could be minimized by careful retention of vegetation screens existing around the plant site.

Noise levels and air quality. Good.

Zoning and development issues. See "surrounding development", above.


IMPACT MATRIX
SITE: Ipswich
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Lynn. USGS Quad Lynn.

Watershed Saugus River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						
X explicit by M & E						X
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

X Secondary proposed

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 24, 2020 23, 2050 21.

Plant/Facility; needed area (acres)

2000 16

Plant/Facility; areas served Lynn, Saugus, & Nahant

Site Specifics:

Terrain: Flat; manmade fill area.

Vegetation: Very limited; some new plantings by City.

Soils:

Special features: Area is fill against bulk head and edge of Lynn Harbor, City has constructed park at one end of site within the past 12-18 months. Site butts rear of shopping center and an old abandoned dump.

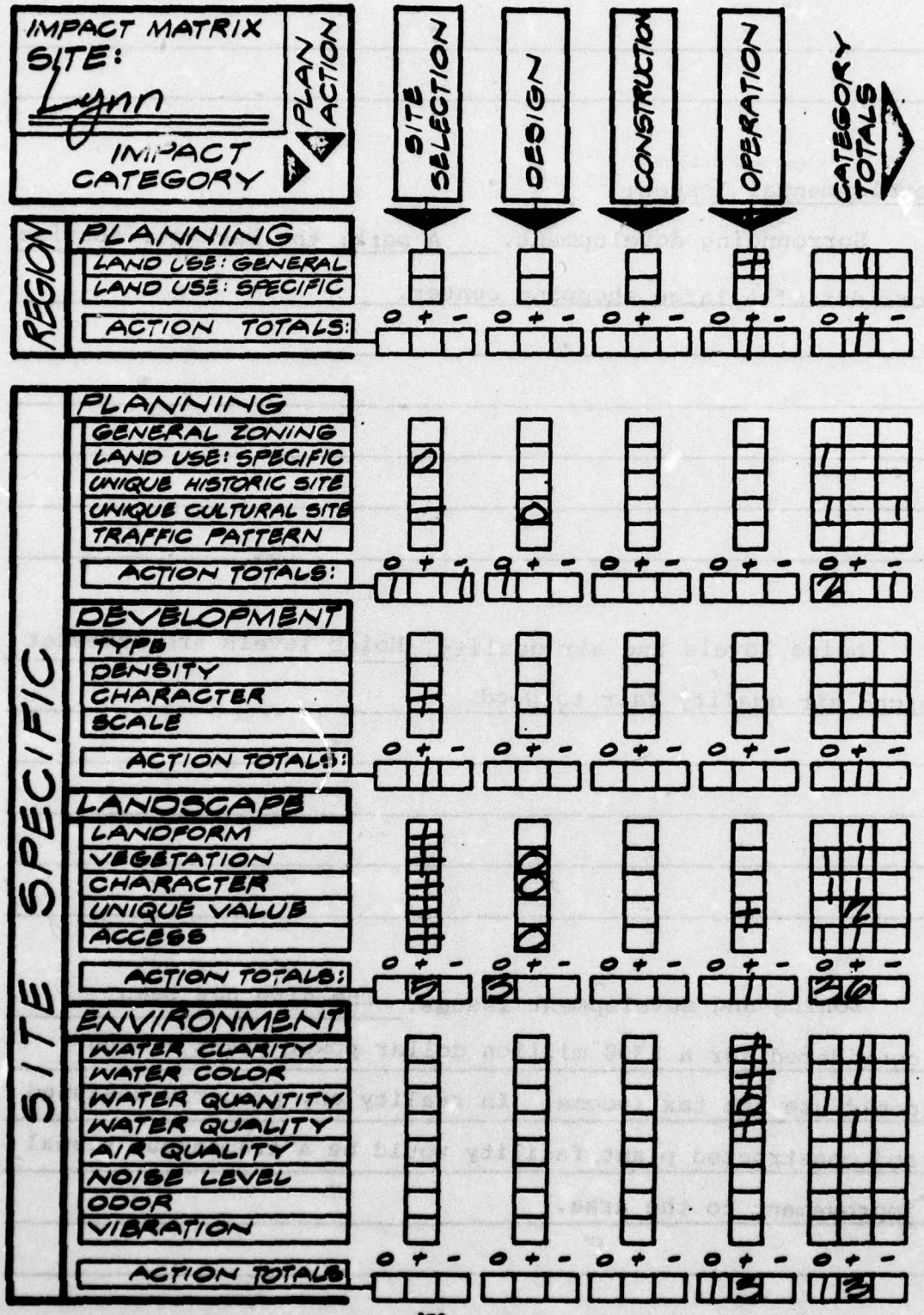
General site character: Very urban; a run down "backside" appearance. Much of the harbor is exposed tidal mud flats at low tide. The area is often used for an urban dump and abandoned cars are common.

Developmental Issues:

Surrounding development. A park; the backdoor service corridor of a large shopping center.

Noise levels and air quality. Noise levels are somewhat high; air quality fair to good.

Zoning and development issues. The site has been considered for a $300 million dollar power plant - Lynn could use the tax income. In reality any properly designed and constructed plant/facility would be a tremendous visual improvement to the area.


IMPACT MATRIX
SITE:
Lynn
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Lowell. USGS Quad Lowell.

Watershed Merrimack River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						
____ explicit by M & E						
X explicit by others (W. & H.)						X
____ interpreted by W & H.						

Area available (if limited and known) Approx. 14 acres.

Plant/Facility type

____ Primary _____

X Secondary proposed (see note "A", below)

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 32, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 _____

Plant/Facility; areas served Lowell, Dracut, Tewksbury and part of Chelmsford

"A": Tentative construction start, summer, 1975

Site Specifics:

Terrain: Flat

Vegetation: None

Soils: Common fills

Special features: Site is highly visible driving along major roadway.

General site character: Site is under construction. Current status is a fill operation linking an existing island (completely obliterated) and the river bank.

Developmental Issues:

Surrounding development. One or two single family homes and a roadside restaurant, (all within 100 yards). Road alignment topography and river limit further development in the immediate area of the site.

Noise levels and air quality. Noise level is generally high (traffic noise) to the proximity of the roadway (Route 110) Tends to overcome any possible natural river noises.

Zoning and development issues. Minimized due to topography existing development and river. Only potential issue is conflict of river access/use for recreation and problem of increased traffic turning movements where existing road is poorly aligned.

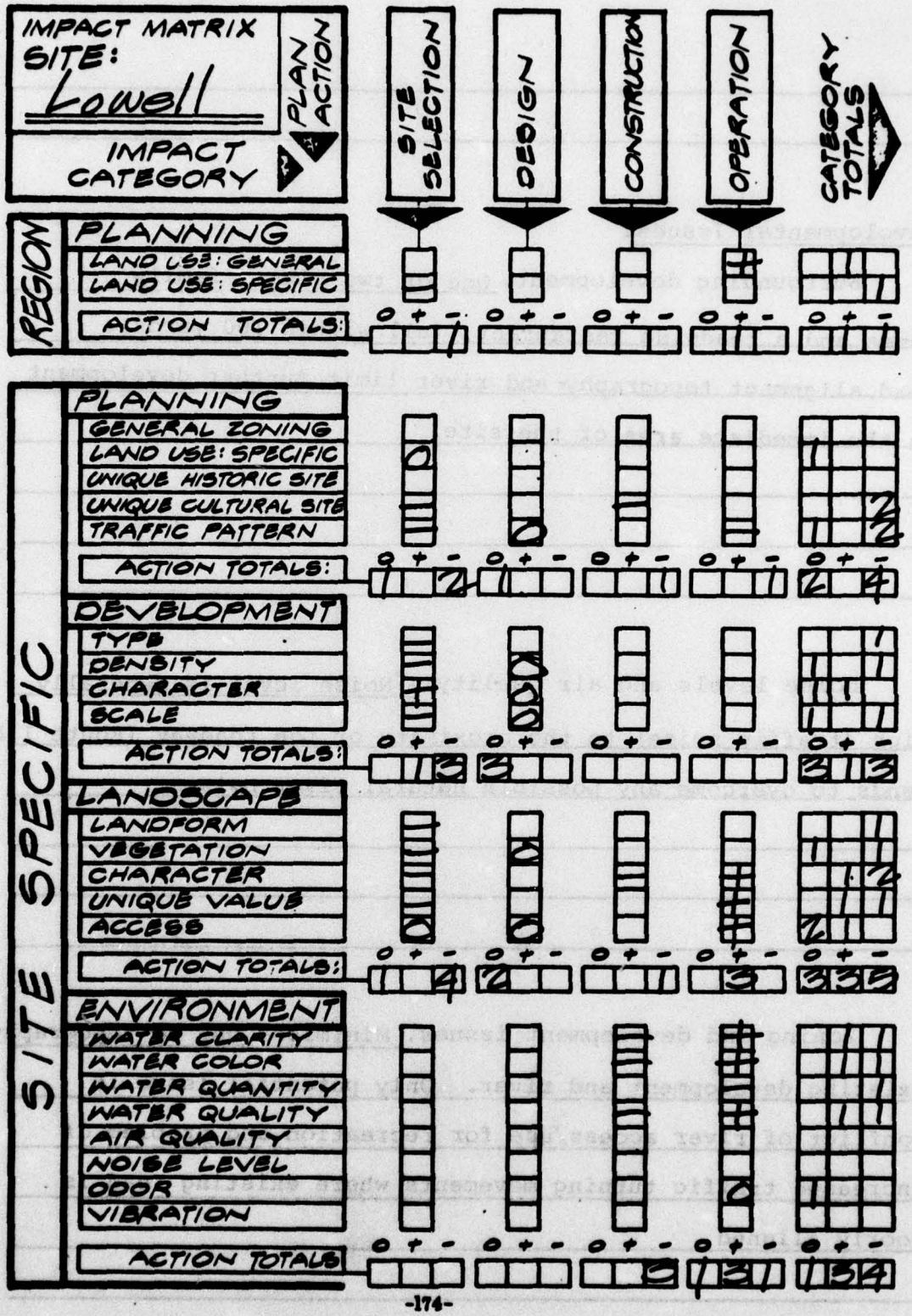
AD-A036 812 METCALF AND EDDY INC BOSTON MASS F/G 13/2
WASTEWATER ENGINEERING AND MANAGEMENT PLAN FOR BOSTON HARBOR - --ETC(U)
OCT 75

UNCLASSIFIED NL

3 OF 3
AD A036812



END
DATE FILMED
4-77


IMPACT MATRIX
SITE: Lowell
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Manchester. USGS Quad Marblehead No.

Watershed North Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

__X__ existing facility

____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx. 3 acres.

Plant/Facility type

____ Primary _____

__X__ Secondary existing

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 0.5 (W&H), 2020 2.3 (M&E), 2050 2.4 (M&E).

Plant/Facility; needed area (acres)

2000 Approx. 1.5 acres.

Plant/Facility; areas served Manchester

Site Specifics:

Terrain: flat

Vegetation: none

Soils:

Special features: The plant is located directly behind the town's central business block and is bounded by the Town, Hall, the police and fire stations, the V.F.W. Hall and Manchester Harbor.

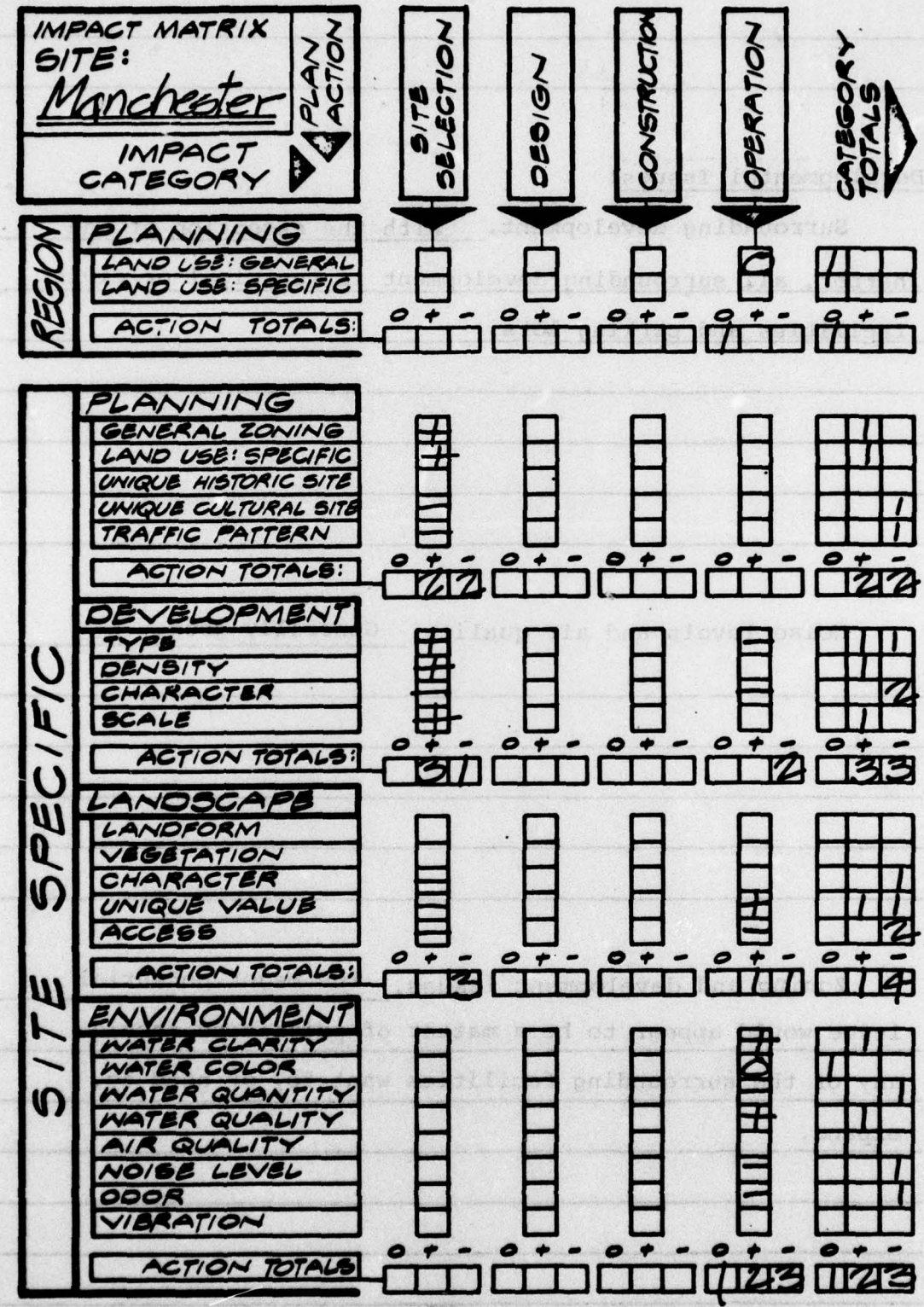
General site character: Typical small New England town urban setting. The most outstanding feature of the site is Manchester Harbor.

Developmental Issues:

Surrounding development. With the exception of the harbor, all surrounding development is municipal or civic facilities and parking lots.

Noise levels and air quality. Generally good.

Zoning and development issues. The major potential issue would appear to be a matter of priorities should any of the surrounding facilities want to, or need to, expand.


IMPACT MATRIX
SITE:
Manchester
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Marlborough (East). USGS Quad Framingham.

Watershed Sudbury River. Used in Concepts

Site Designation

1	2	3	4	5	All
					x

x existing facility

____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx. 40 acres.

Plant/Facility type

____ Primary _____

____ Secondary _____

x Advanced Existing

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 (1) 5.8 (2,3,4,5) 4.5 2020 (1) 8.3 (2,3,4,5) 6.3 2050 (1) 10 (2,3,4,5) 6.6.

Plant/Facility; needed area (acres)

2000 (1) 6.5

Plant/Facility; areas served Concept 1; Marlborough (east) and Southborough. All other concepts, municipal system for Marlborough only.

Site Specifics:

Terrain: Due to its being a new plant the site is flat, particularly the extensive area of abandoned lagoons. Adjacent land to the west & east is much higher.

Vegetation: The actual plant site (old & new) is free of vegetation. However, the site is surrounded by dense pine groves and/or natural mixed hard/softwoods.

Soils:

Special features:

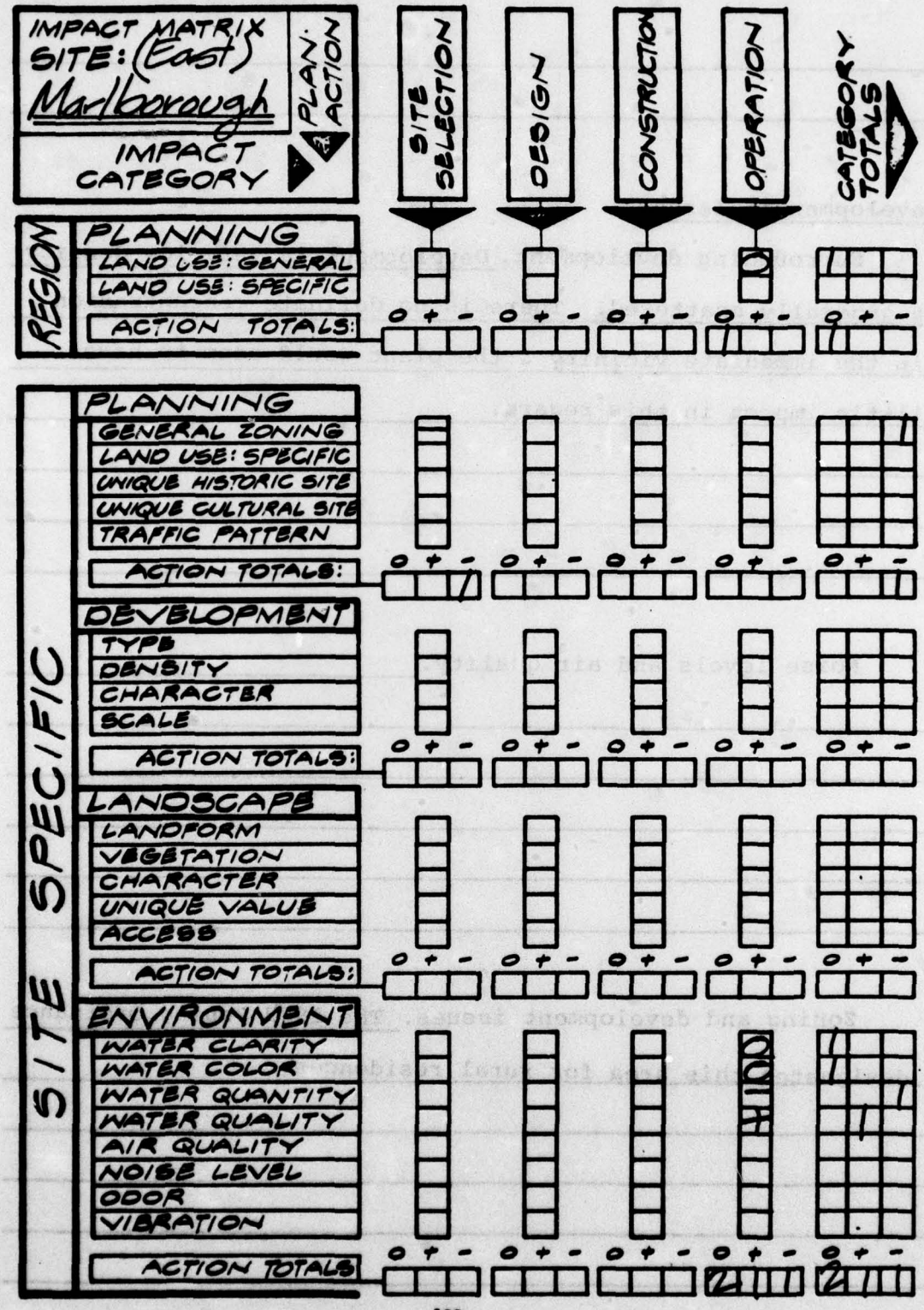
General site character: The area has a rural character. Land is well forested & high ground helps conceal it from view.

Developmental Issues:

Surrounding development. Development is very low density & generally scattered. There is no definate concentration in the immediate vicinity & the plant would seem to have little impact in this regard.

Noise levels and air quality.

Zoning and development issues. The 1969 Zoning Ordinance designates this area for rural residences.


IMPACT MATRIX
SITE: (East) Marlborough
PLAN. ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Marlborough (West). USGS Quad Marlborough.

Watershed Assabet. Used in Concepts

Site Designation	1	2	3	4	5	All
x existing facility						x
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) Approx. 15 acres.

Plant/Facility type

___ Primary _____

_x_ Secondary Existing _____

x Advanced proposed _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 9.3, 2020 10, 2050 14.

Plant/Facility; needed area (acres)

2000 9.5

Plant/Facility; areas served Marlborough, Northborough and Berlin after 2000

Site Specifics:

Terrain: Existing plant site is flat while adjacent land slopes gently away to wetlands.

Vegetation: Actual site is open (i.e. the plant itself). Adjacent land is heavily forested with pine and mixed hardwood/ softwood trees.

Soils:

Special features: Site is on shore of Millham Reservoir.

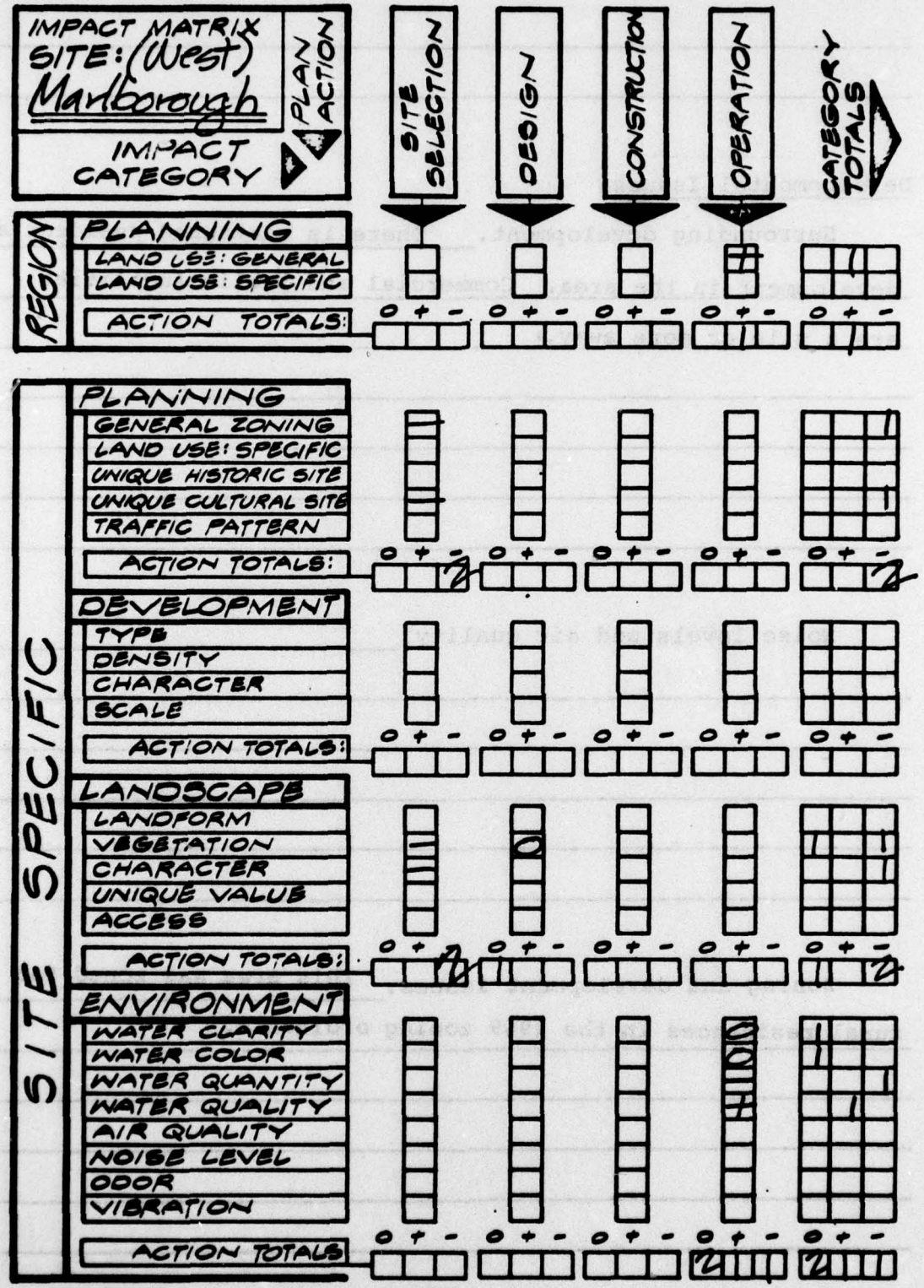
General site character: Basically rural and well-forested. The reservoir and marshland along the river are significant open space areas.

Developmental Issues:

Surrounding development. There is scattered residential development in the area. Commercial and public facilities are a mile or more away.

Noise levels and air quality.

Zoning and development issues. This area was zoned for rural residences in the 1969 zoning ordinance.


IMPACT MATRIX
SITE: (West) Marlborough
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Marshfield. USGS Quad Duxbury.

Watershed South Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) Limited to east; vacant land (marsh) to west.

Plant/Facility type

X Primary existing

X Secondary proposed

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 3.0, 2020 4.7, 2050 6.9.

Plant/Facility; needed area (acres)

2000 3.3

Plant/Facility; areas served Marshfield (Southern) plus Duxbury (after 2000)

Site Specifics:

Terrain: Salt marsh along Green Harbor River estuary. Land is flat with occassional plateaus rising about 4' above tidal marsh.

Vegetation: Marsh grass with reeds etc., on higher ground, no trees.

Soils:

Special features: Extreme proximity to existing development and compact size of present plant.

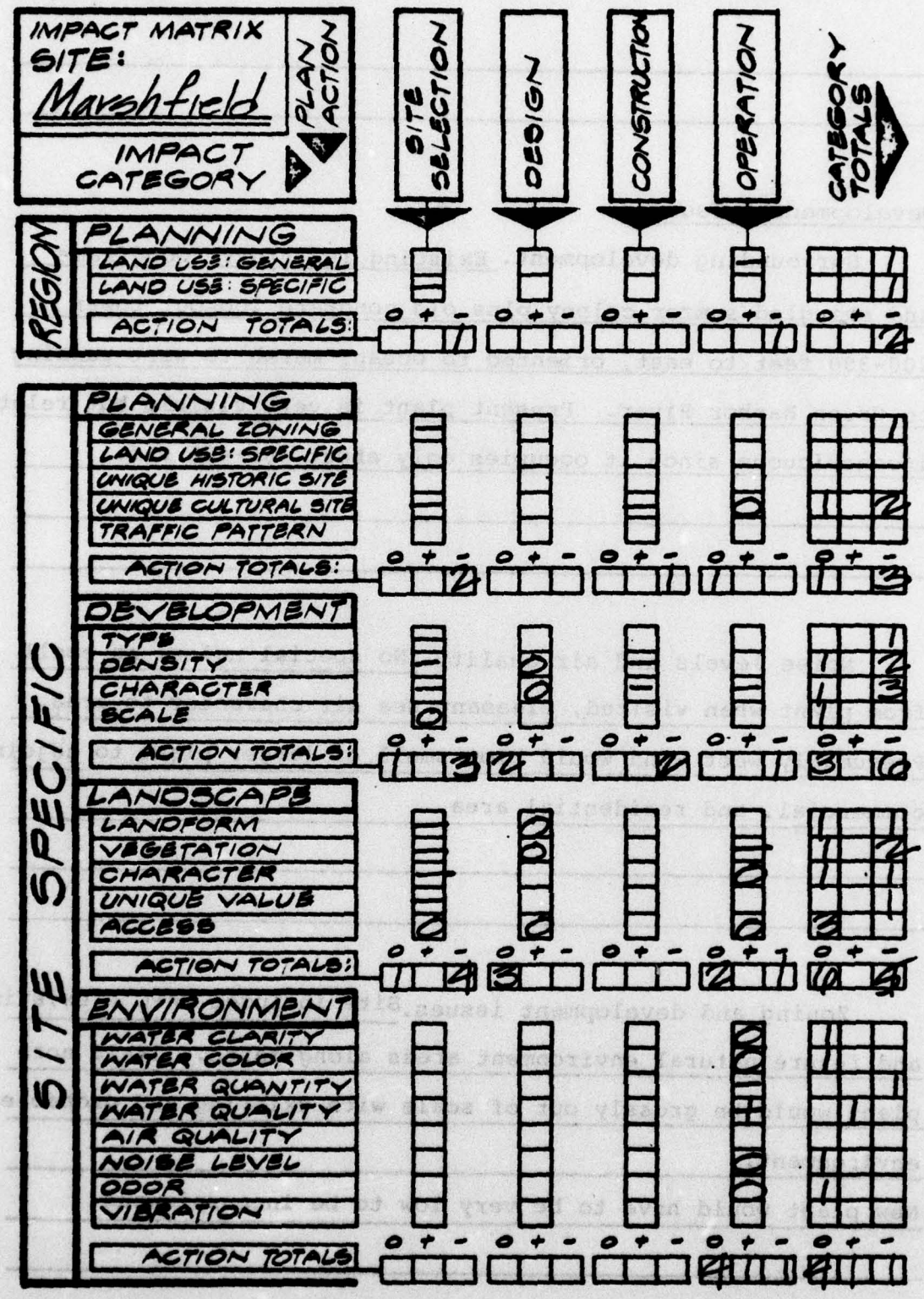
General site character: Salt marsh, open, backing on to local summer colony.

Developmental Issues:

Surrounding development. Existing 1-3 story, woodframe and shingled summer colony plus old concrete lookout tower 200-300 feet to east, oriented to ocean; marsh to west running to Green Harbor River. Present plant is very visible but relatively inconspicuous since it occupies only about 300-400 s.f.

Noise levels and air quality. No special noise, no smell from plant when visited, pleasant sea air character to area. Presumably west wind would blow smell of larger plant to adjoining commercial, and residential area.

Zoning and development issues. Site includes MAPC's existing and future natural environment areas along marsh. 14-18 acre plant would be grossly out of scale with existing and probable environment.
New plant would have to be very low to be inconspicuous.


IMPACT MATRIX
SITE:
Marshfield
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Medfield. USGS Quad Medfield.

Watershed Upper Charles River. Used in Concepts

Site Designation	1	2	3	4	5	All
x existing facility Under Construction	x	x		x	x	

____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known)_____.

Plant/Facility type

____ Primary _____

x Secondary under construction

x Advanced proposed

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 4.0, 2020 7.0, 2050 9.6.

Plant/Facility; needed area (acres)

2000 4.9

Plant/Facility; areas served Medfield, Millis and Eastern two thirds of Norfolk after 2000

Site Specifics:

Terrain: A triangular, pointed low hill tapering into Charles River marshes, and excavated in the center (as though for sand and gravel) leaving 20'-30' high ridges around 2 sides of the site and a slight railroad embankment on the third side. Surrounding terrain is marsh to west, river and marsh to south and southeast, and old sand pits to northeast.

Vegetation: Low hardwoods around the edges of the site, some pines on the north and east edges, birch and miscellaneous hardwoods on the point to the west, shrubs and grass on marsh. (marsh immediately north of the site is open, not forested as the USGS seems to indicate.

Soils: Sandy.

Special features: At present the site is conspicuously closed and well screened by remaining ridges. The point of high land remaining to the west of the site has considerable park potential with its attractive wooded, character in contrast to surrounding river and marsh.

General site character: Level sandy soil surrounded by low ridges, well screened from surroundings, ground slopes 10-15' to the river, sloping steeply to southwest, more gradually to northeast and tapering off to the west. Eastern edge is along Railroad.

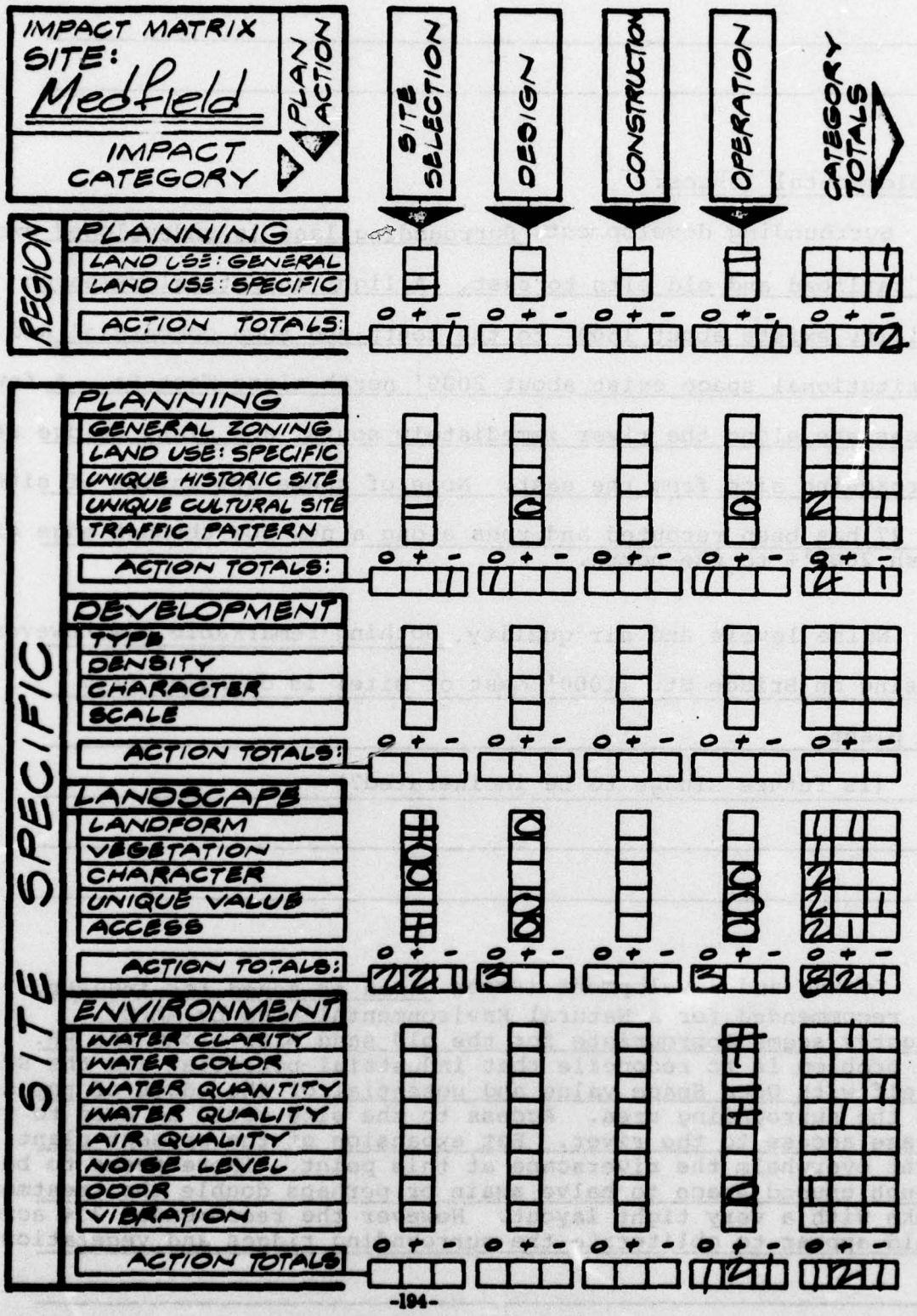
Developmental Issues:

Surrounding development. Surrounding land is undeveloped except for railroad and old pits to east. A light industrial/research facility exists about 1500' to the south and some commercial and institutional space exist about 2000' north along West St. A few houses are along the river immediately south, and along Bridge St. approaching site from the east. None of these are inview of site. Rt. 27 has been rerouted and runs along a new ROW through edge of marsh 2000'+ to the north.

Noise levels and air quality. Nothing remarkable now;however, housing on Bridge St. (1000' east of site) is downwind from the plant.

(Is future sludge to be incinerated?)

Zoning and development issues. Area is zoned for industry but recommended for a Natural Environmental Area by MAPC. Industry seems appropriate for the old sand pits along the RR. The problem is to reconcile that industrial potential and the STP itself with Open Space value and potential of the edges of the site and the surrounding area. Access to the site could be used to increase access to the river. But expansion of the present plant might overwhelm the riverscape at this point. There seems to be enough unused space to halve again or perhaps double the treatment tanks with a very tight layout. However the recommended 23+ acres would appear to obliterate the surrounding ridges and vegetation.


IMPACT MATRIX
SITE: Medfield
IMPACT CATEGORY
PLAN ACTION
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Medford. USGS Quad Lexington Boston North.

Watershed Mystic River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility				X	X	

____ X ____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx. 20 acres.

Plant/Facility type

____ Primary _____

__x__ Secondary Concept 5

__X__ Advanced Concept 4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 (4) 30 (5) 28 2020 (4,5) 31, 2050 (4,5) 29.

Plant/Facility; needed area (acres)

2000 (4,5) 25

Plant/Facility; areas served Arlington, Bedford, Lexington and parts of Belmont, Medford, and Winchester.

Site Specifics:

Terrain: The area is low, flat river bottom land along the Mystic River. The width of this low area is fairly narrow as the land rises quickly within short distances of the river; especially to the north.

Vegetation: There is a scattering of specimen trees through what is predominately an open space setting.

Soils:

Special features: Site is a recreation space. There is a historical site across the parkway.

NOTE: Not considered an appropriate site in any case.

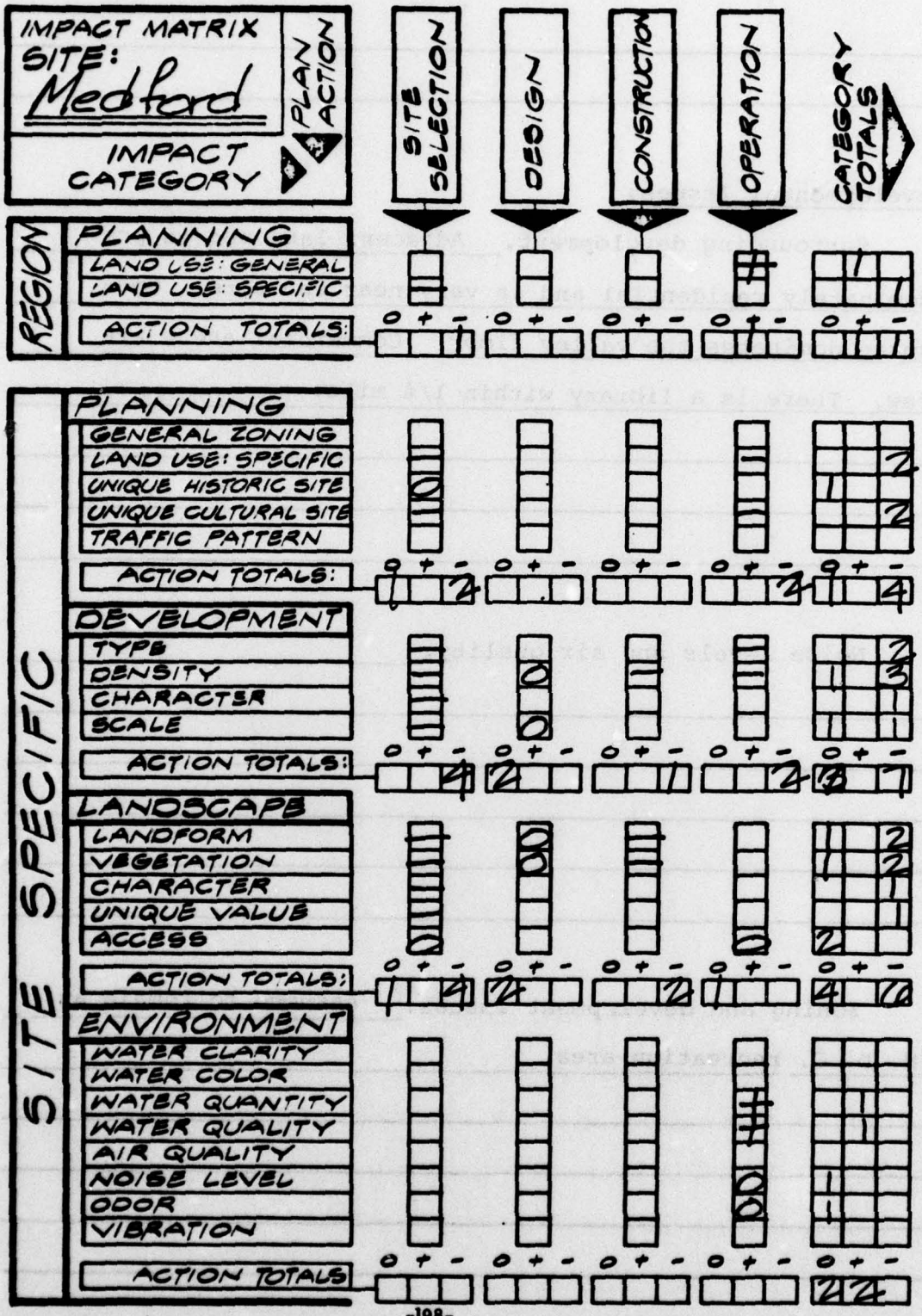
General site character: This area is a narrow river valley with well treed residential areas on the slopes. The actual valley floor is of a horizontal character with a series of flowing linear spaces.

Developmental Issues:

Surrounding development. Adjacent land use is predominately residential and is very near the site. Open space dominates the valley floor. Commercial areas are few. There is a library within 1/4 mile.

Noise levels and air quality.

Zoning and development issues. Assumed to remain an M. D. C. recreation area.


IMPACT MATRIX
SITE: Medford
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Medway. USGS Quad _____.

Watershed Upper Charles River. Used in Concepts

1	2	3	4	5	All
X	X		X	X	

Site Designation

____ existing facility

__X__ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed, all concepts

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)
(1,2,4)8(5)7.4 (1,2,4,5)15
2000 _____, 2020 _____, 2050 (1,2,4,5)21.

Plant/Facility; needed area(acres)

2000 (1,2 & 4) 8.5

Plant/Facility; areas served Bellingham, Franklin, Holliston, Medway, Norfolk, Wrentham, plus western third of Medway after 200

Site Specifics:

Terrain: Rolling hill dropping down to Charles River flood plain, and marsh at edge of Populatic lake. Site ranges from about 140' to 130'.

Vegetation: Low wetlands plants, brush about 6' high trees at edge.

Soils:

Special features: Charles River enters and leaves the Pond at the low end of the site, power line crosses site from north to south.

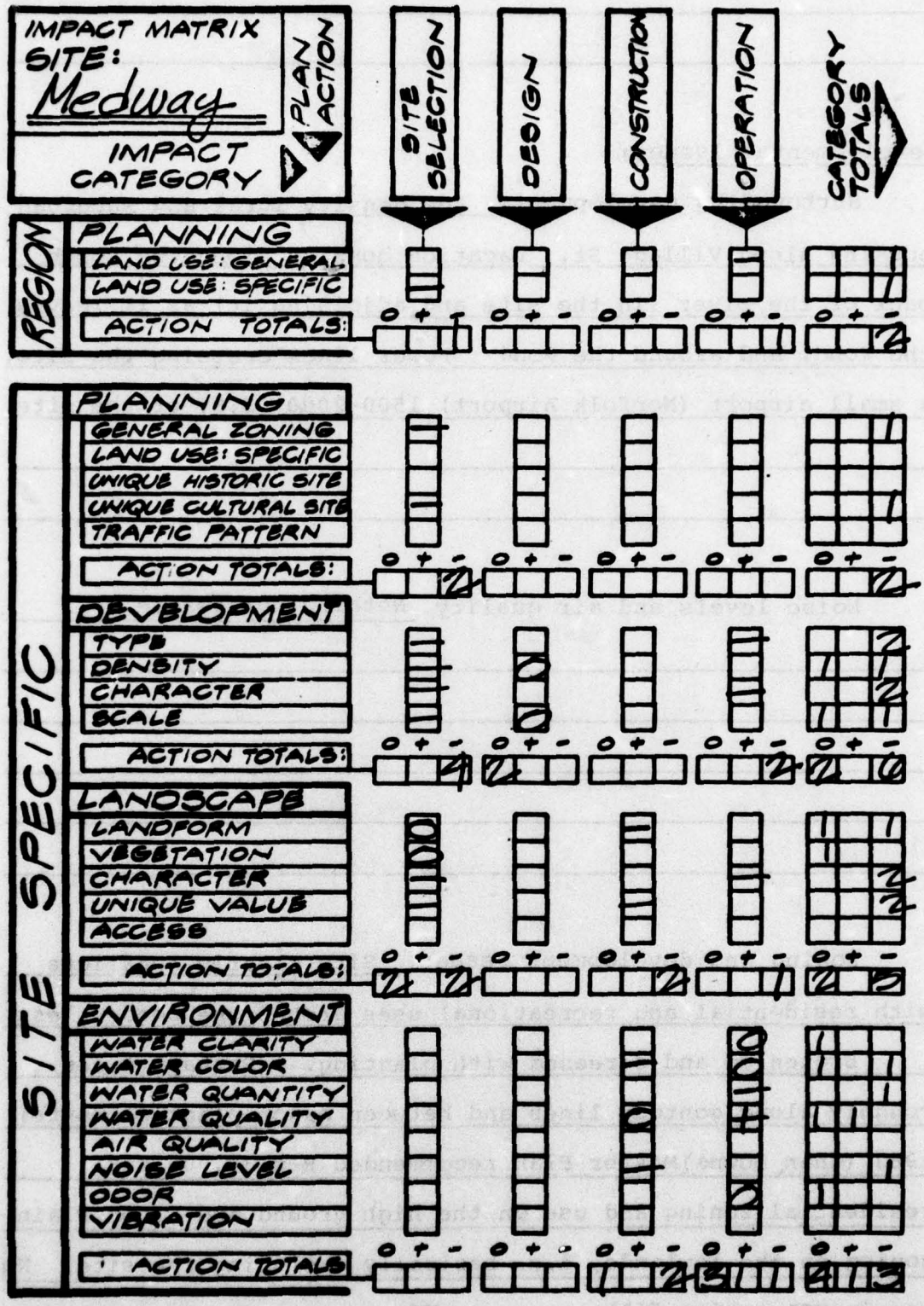
General site character: Site appears to fill whole area between road (Village St.) and the Pond and would probably overwhelm the site and be very visible from the pond.

Developmental Issues:

Surrounding development. Low density rural and suburban housing along Village St., Vacation housing along the south bank of the river (in the site and adjoining it) as it leaves the Pond, and around the Pond Power lines crossing the site. A small airport (Norfolk Airport) 1500-2000' S.E. of the site.

Noise levels and air quality. Nothing noticeable

Zoning and development issues. Site clearly conflicts with residential and recreational uses around the pond unless it is broken up and screened with planting. (Perhaps trees roughly along contour lines and between major plant elements) 1963 (Chas. Downe) Master Plan recommended R-2 30,000 S.F. residential zoning and use on the high ground and Flood Plain zoning on the lowlands, i.e. basically excluding the site. No map was in DCA zoning file.


IMPACT MATRIX
SITE:
Medway
IMPACT CATEGORY
PLAN ACTION
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Middletown. USGS Quad Salem.

Watershed Ipswich River. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

____ existing facility

__X__ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 2.4, 2020 3.8, 2050 5.4.

Plant/Facility; needed area(acres)

2000 3.5

Plant/Facility; areas served Middletown, North Reading

Site Specifics:

Terrain: flat

Vegetation: Large deciduous and evergreen materials around edges of site.

Soils:

Special features: No special features. Site is a fairly small open field.

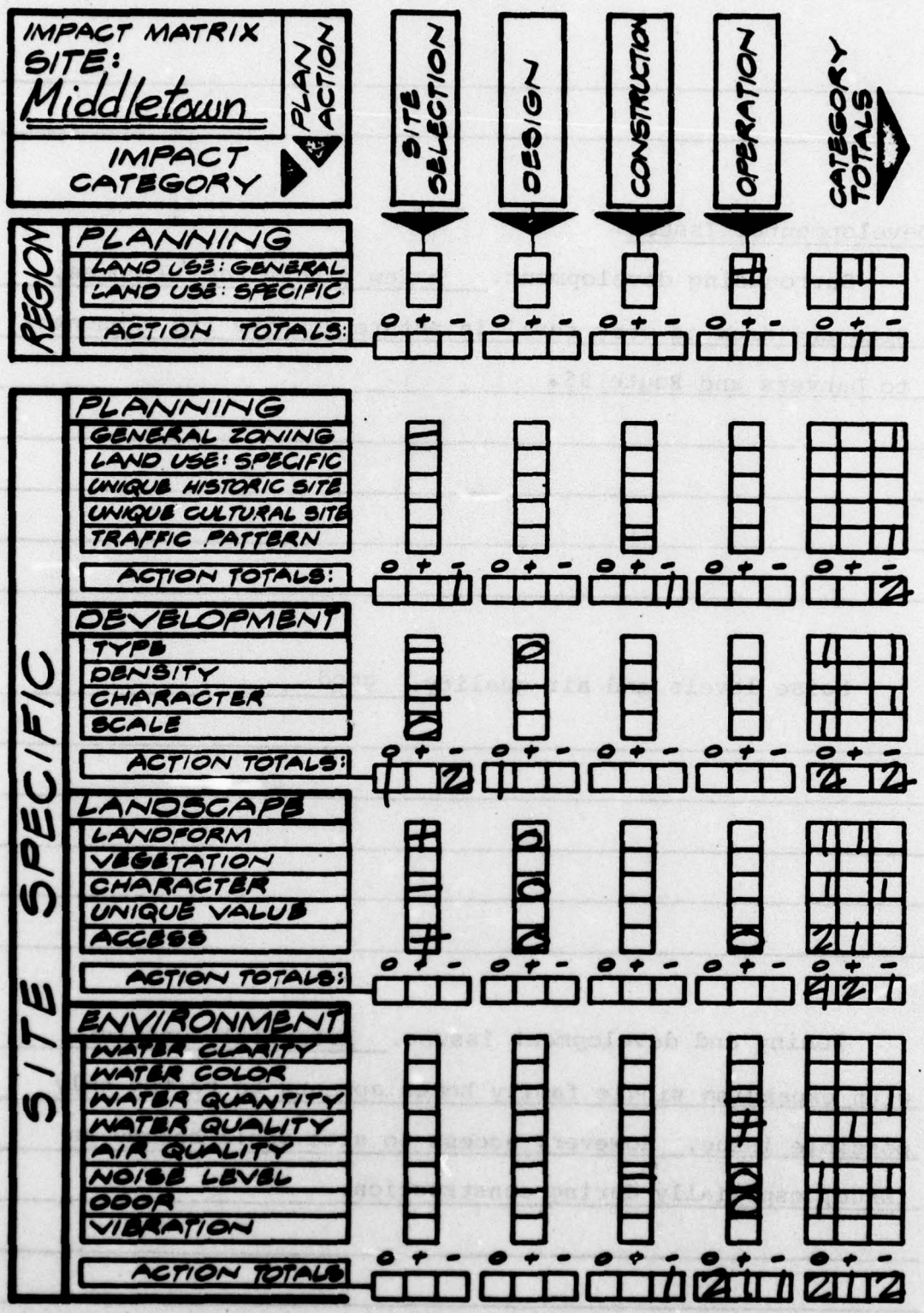
General site character: Open field with hedge row vegetation along two sides.

Developmental Issues:

Surrounding development. A few single family homes, Site and area is very rural in nature despite its closeness to Danvers and Route 95.

Noise levels and air quality. good

Zoning and development issues. Potential conflict with expanding single family homes appears to be the only possible issue. However, access to site could become an issue, especially during construction.


IMPACT MATRIX
SITE:
Middletown
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Nut Island. USGS Quad Hull.

Watershed Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
____ explicit by M & E						
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

__x__ Primary Existing

__X__ Secondary Proposed

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

Concept 1;
2000 175, Concept 2;90, Concept 3; 195. Concept 4; 100

Plant/Facility; needed area(acres)

2000 Concept 1; 53. Concept 2; 35. Concept 3; 57. Concept 4; 37.

Plant/Facility; areas served Portions of the M.D.C. sewer district; varies from concept to concept.

Site Specifics:

Terrain: Site is a low hill (20+ft.) east of Hough's Neck (Quincy) and adioining fill along a causeway to Hough's Neck. Adjoining portion of Hough's Neck is a 100' residentially developed hill ("Quincy Great Hill"). Surroundings are very scenic areas of Quincy and Hingham Bays., with Peddock's Island (publicly acquired recently with some summer homes remaining on rented MDC land) about 1/2 mile to the east.

Vegetation: little grass and some trees.

Soils:

Special features: Very conspicuous site, present plant is visible for miles, site has very pretty setting, with good views of harbor and Boston Skyline.

General site character: former island now connected to mainland by causeway and filled site.

Developmental Issues:

Surrounding development. Housing, mostly year round to west on Hough's Neck; summer housing and public lands on Peddock's Island 1/2 mile to the east; Quincy and Hingham Bays with much recreational boating to north and south.

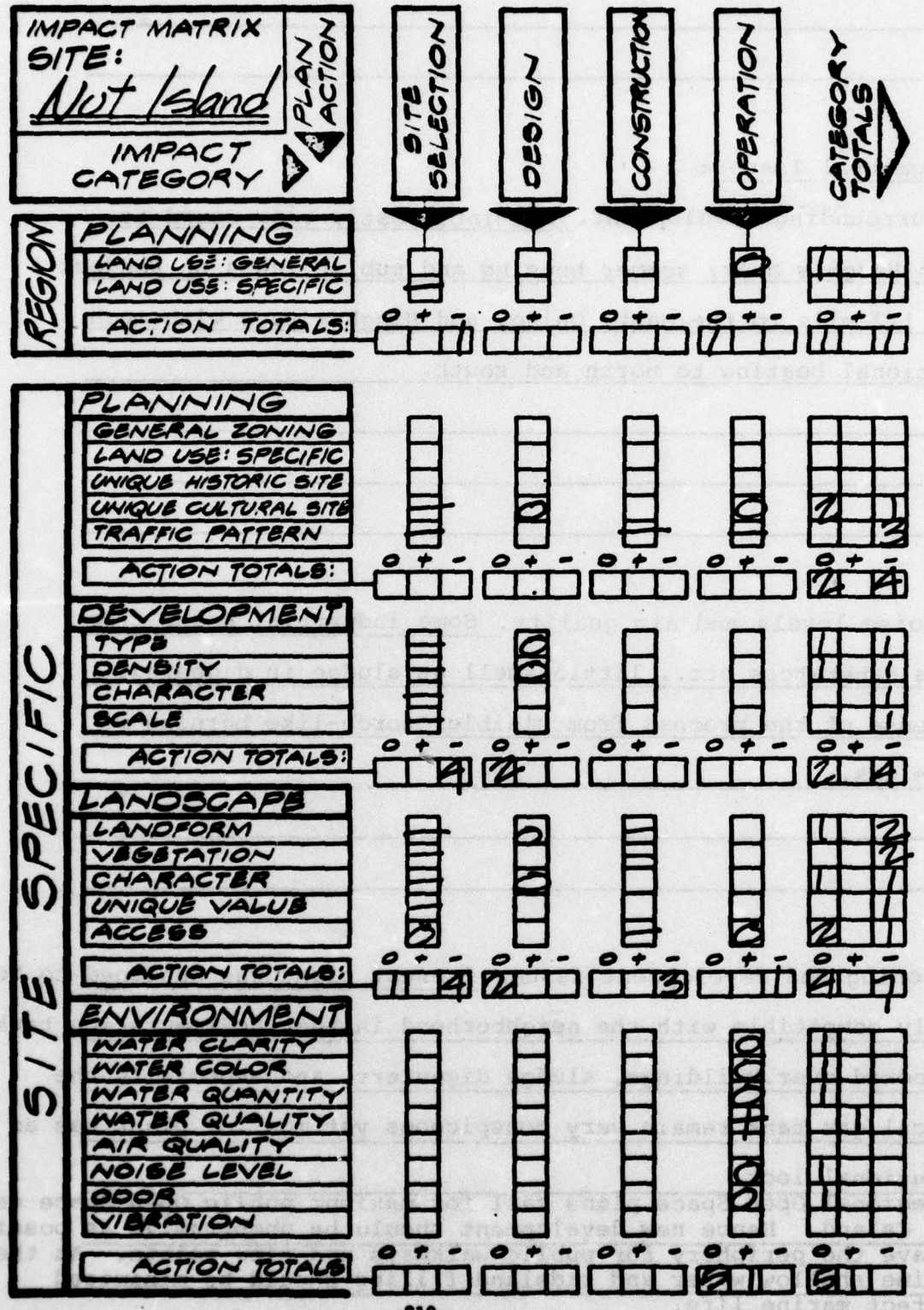
Noise levels and air quality. Some industrial noise from plant's generators etc., little smell as sludge is digested, some sense of the process from visible, torch-like burning of surplus gas.

Zoning and development issues. Present plant was designed to be visually compatible with the neighborhood in that sedimentation tanks were decked over. Buildings, sludge digesters, and especially the spherical gas tank remain very conspicuous yet most of plant has an institutional look.

Regional Open Space plans call for maximum public Open Space use of Nut Island. Hence new development should be unobtrusive as possible and leave the periphery for public walkways and view points. At the same time shallow water and tideland filling should be minimized to protect marine life.

High traffic generating public uses probably should not be encouraged to avoid increasing traffic through Hough's Neck.

MAPC OPEN SPACE PLAN calls for a Natural Environment Area.


IMPACT MATRIX
SITE:
Nut Island
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Rockland. USGS Quad Whitman.

Watershed North River. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

X existing facility

___ explicit by M & E

___ explicit by others

___ interpreted by W & H.

Area available (if limited and known) Approx. 15 acres.

Plant/Facility type

X Primary existing

___ Secondary

X Advanced proposed

___ Spray Irrigation

___ Rapid Infiltration

Present capacity is 1.0 mgd. Supt. wants to expand to 1.5 to 2.0 mgd.

Plant/Facility; capacity (MGD)

2000 1.7, 2020 2.7, 2050 2.5.

Plant/Facility; needed area (acres)

2000 2.7

Plant/Facility; areas served Rockland

Site Specifics:

Terrain: Sloping gently or flat, site is at edge of Beech Hill swamp. Most of rear of site is marsh or swamp.

Vegetation: Pines and some hardwood on high ground. Brush and low wetlands vegation on wetland.

Soils:

Special features: Site is well isolated.

General site character: Low rise protruding into swamp.

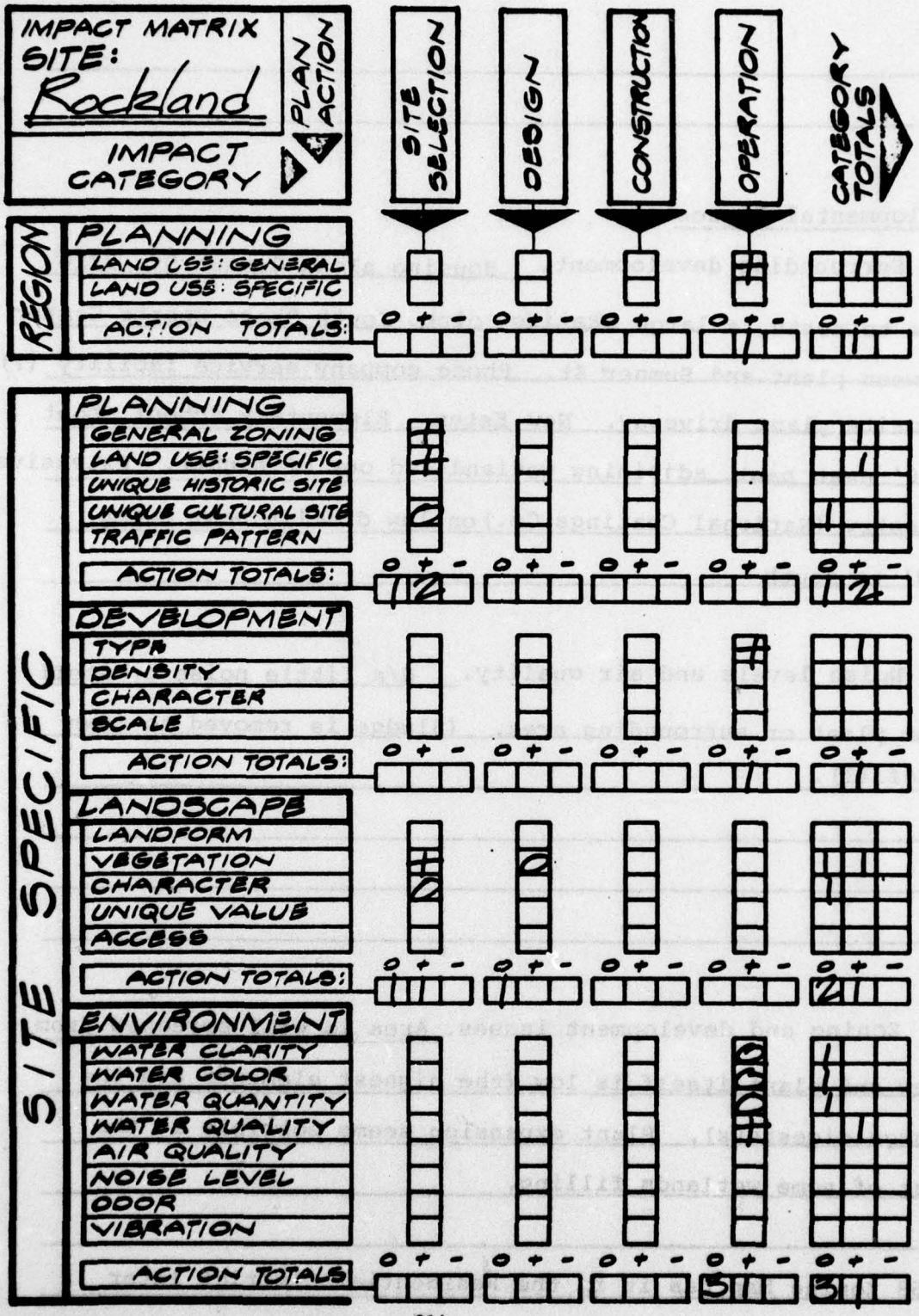
Developmental Issues:

Surrounding development. Housing along Sumner St. 2/10 mile to north, a large Skating club. South Shore Sports Center between plant and Sumner St. Phone company service facility (?) opposite plant driveway. New Esten Elementary School about 1000' east past adjoining wetland and out of sight). Extensive industry (National Coatings Co.) on low drumlin past swamp 2000' to south

Noise levels and air quality. N/a little noise or smell from plant or surrounding area. (Sludge is removed to town landfill).

Zoning and development issues. Area is well screened from view and plant itself is low (the highest elements are the sludge digesters). Plant expansion seems possible at the cost of some wetlands filling.

1958 Zoning Map has it in the Residential District later amendments greatly increased industrial area and probably included the plant site. (No map was available).


IMPACT MATRIX
SITE:
Rockland
IMPACT CATEGORY
PLAN ACTION
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Rockport. USGS Quad Rockport Gloucester.

Watershed North Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						X
____ explicit by M & E						
X explicit by others (W. & H.)						
____ interpreted by W & H.						

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

X Secondary Under construction as of 9/74

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 1.7, 2020 2.0, 2050 2.5.

Plant/Facility; needed area (acres)

2000 2.7

Plant/Facility; areas served Rockport. (Designed for flow of 0.6 mgd in 1995).

Site Specifics:

Terrain: generally flat, some marsh/wet areas.

Vegetation: dense, mostly deciduous

Soils:

Special features: Site is at end of narrow residential road. Homes are old, but generally well maintained. Very desirable area. Site is adjacent to an old established and well maintained cemetery.

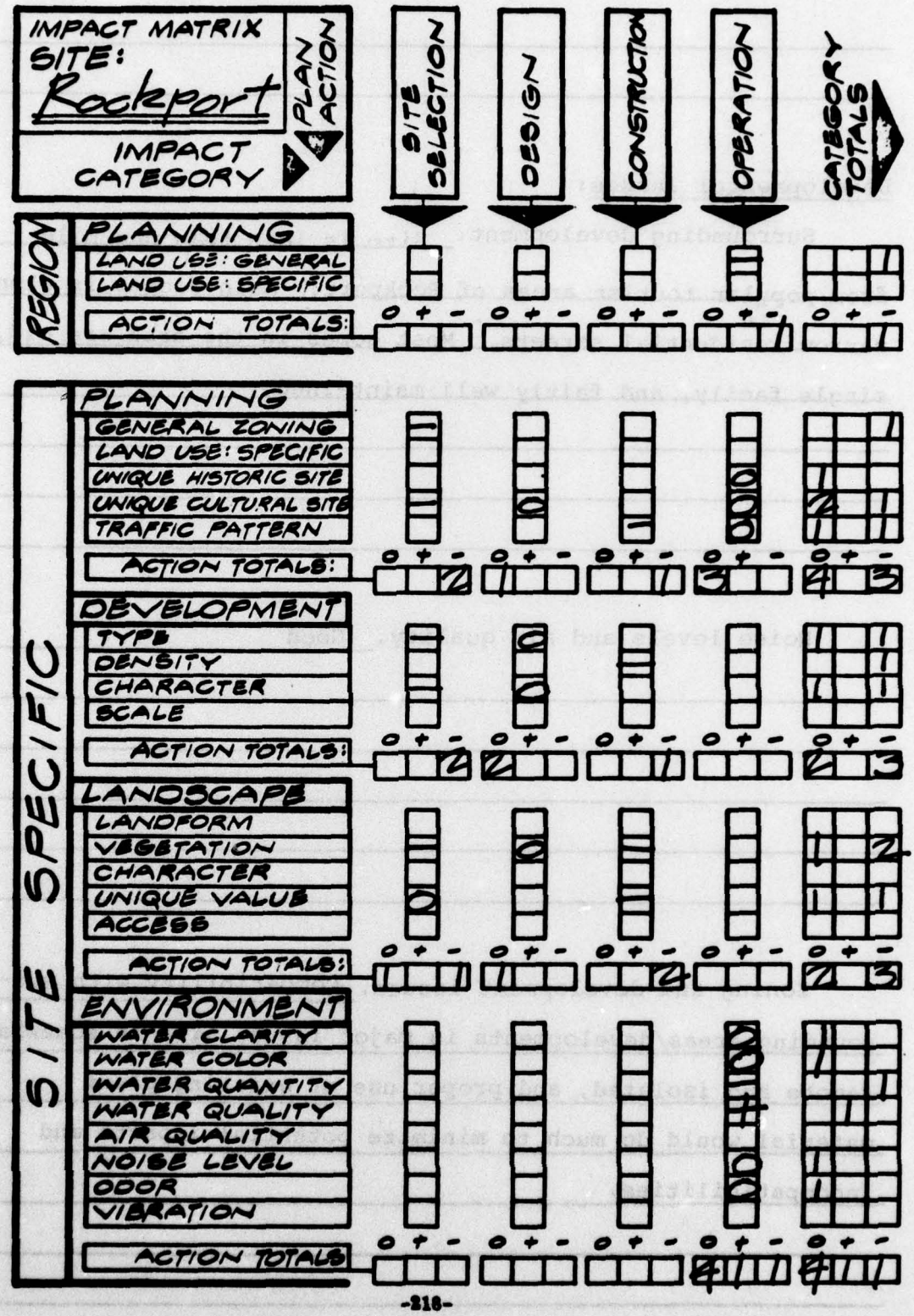
General site character: Wooded.

Developmental Issues:

Surrounding development. Site is less than one mile from popular tourist areas of Rockport. Main access is along narrow residential streets. Most homes in the area are old, single family, and fairly well maintained.

Noise levels and air quality. Good

Zoning and development issues. Compatibility with surrounding areas/developments is major issue; site is somewhat remote and isolated, and proper use of existing plant material would do much to minimize potential impacts and incompatibilities.


IMPACT MATRIX
SITE:
Rockport
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Salem USGS Quad Salem Marblehead.

Watershed _____. Used in Concepts

Site Designation 1 2 3 4 5 All

[ ][ ][ ][ ][ ][X]

__X__ existing facility (under construction)

____ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) _____.

Plant/Facility type

____ Primary _____

__X__ Secondary _____

____ Advanced _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 47, 2020 50, 2050 46.

Plant/Facility; needed area (acres)

2000 27

Plant/Facility; areas served Beverly, Danvers, Marblehead, Peabody & Salem.

Site Specifics:

Terrain: Fairly steep bank down from road to flat plateau out to harbor edge

Vegetation: almost all that may have existed has been removed during construction operation.

Soils:

Special features: the site abutts an existing power plant. The main access is through downtown Salem, past the newly developed historic district and on the way to one of the larger recreation complexes in the area.

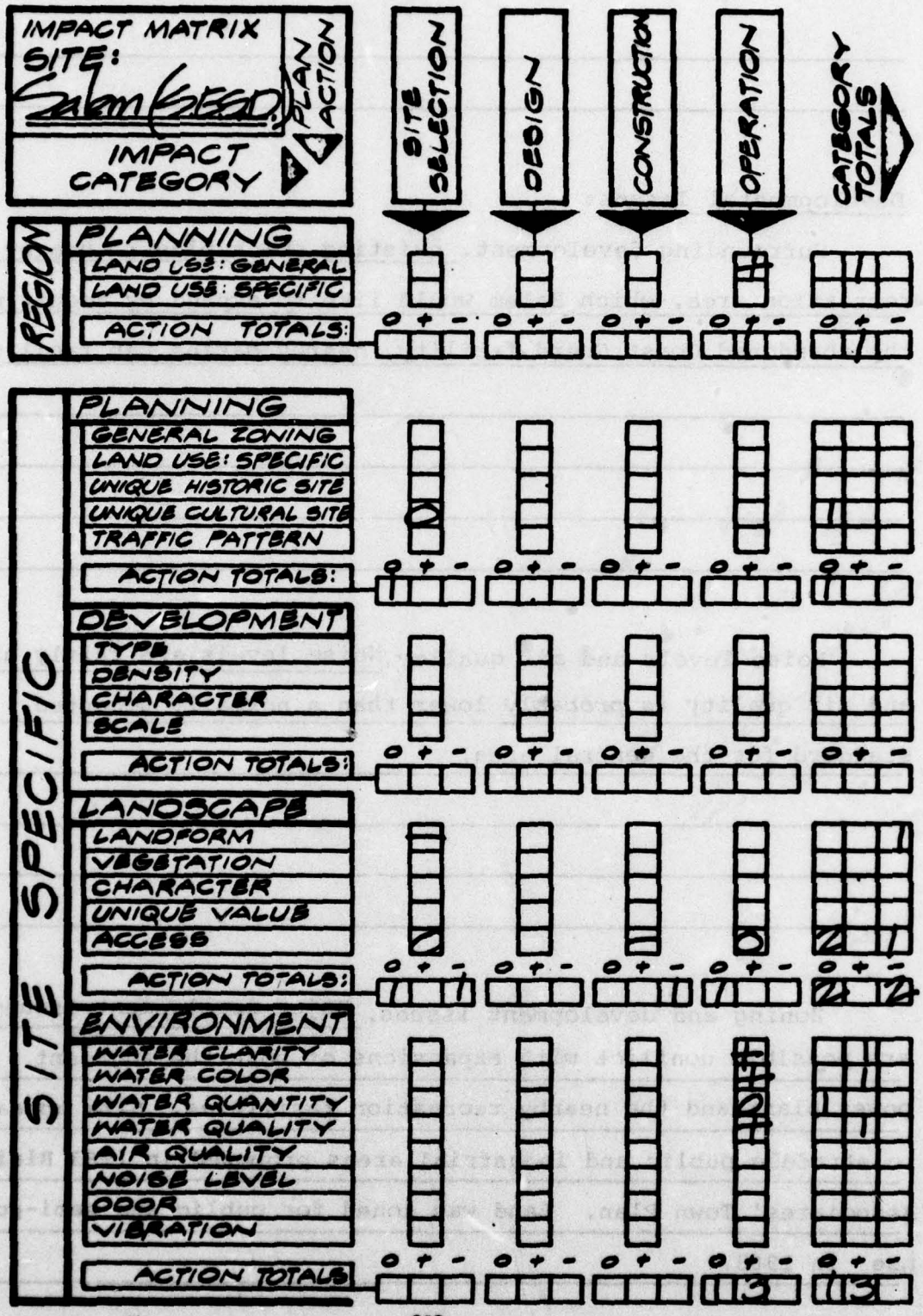
General site character: destroyed by construction

Developmental Issues:

Surrounding development. existing power plant; nearby recreation area, which Salem would like to expand by acquiring the abandoned Coast Guard facility, nearby Marine Lab facility

Noise levels and air quality. Noise levels are fairly high and air quality is probably lower than a normally accepted standard for the general area.

Zoning and development issues. Major development issues are possible conflict with expansions of both the adjacent power plant and the nearby recreation facilities. Site appears to straddle public and industrial areas proposed in 1963 Blair Associates' Town Plan. Land was zoned for public and semi-public use in 1963.


IMPACT MATRIX
SITE: Salem Speedway
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Scituate. USGS Quad Scituate.

Watershed North River. Used in Concepts

Site Designation

1	2	3	4	5	All
					X

X existing facility

___ explicit by M & E

___ explicit by others

___ interpreted by W & H.

Area available (if limited and known) Approx. 11.5 acres.

Plant/Facility type

___ Primary _____

X Secondary 1 mgd capacity

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 5.5, 2020 8.8, 2050 14.

Plant/Facility; needed area (acres)

2000 4.9

Plant/Facility; areas served Hanover, Norwell, Pembroke, and parts of Hanson, Marshfield and Scituate

Site Specifics:

Terrain: low hills and salt marsh along North River Estuary, generall dropping down from sand hills north of the driftway to marsh.

Vegetation: low trees, marsh grass, cattails etc.

Soils: sandy on high ground, then marsh soils

Special features: landscape has a very attractive range of low woods, meadow,brush and marsh making it extremely pleasant for hiking, etc.

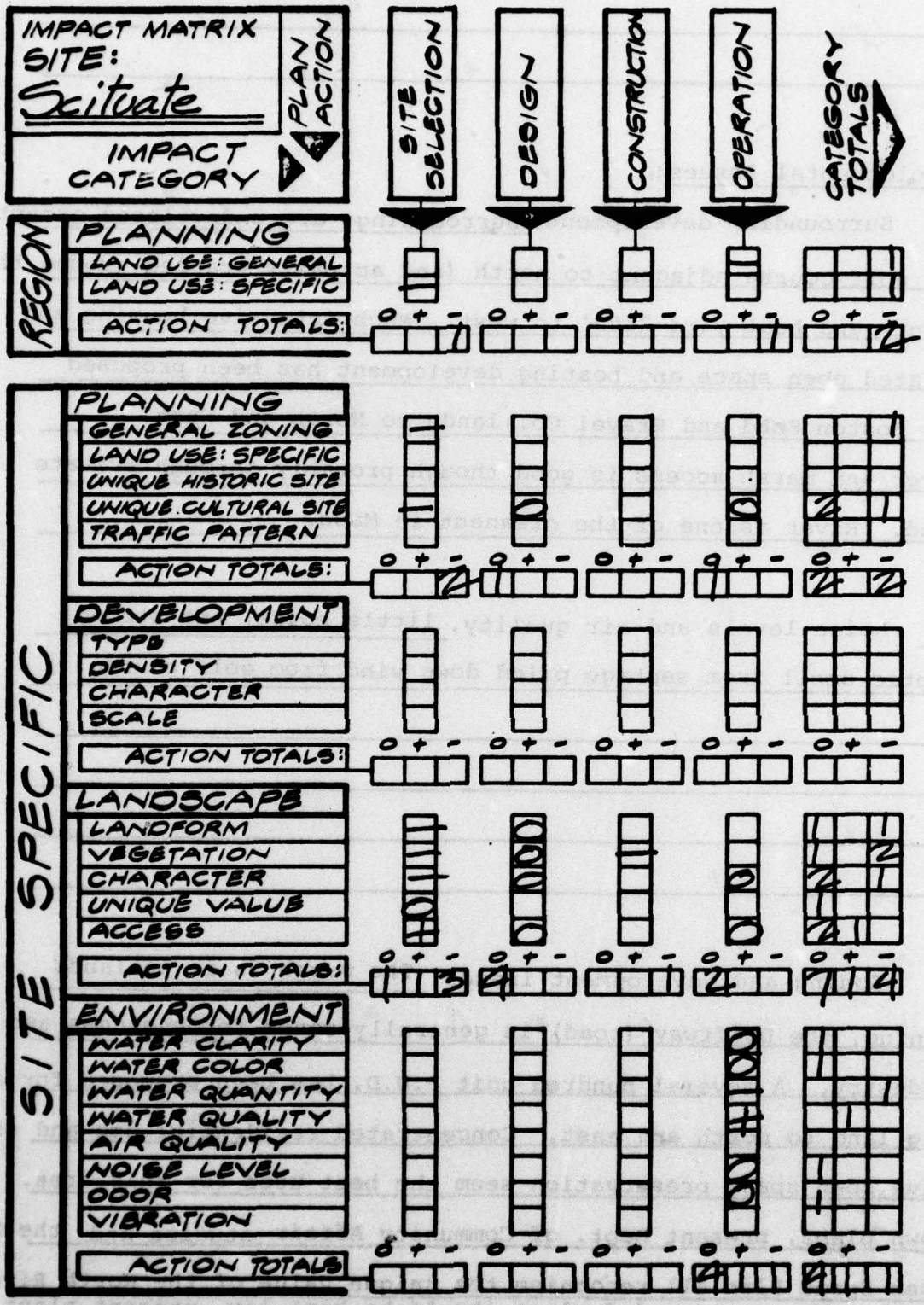
General site character: hills to marsh.

Developmental Issues:

Surrounding development. Surroundings are undeveloped except for golf course adjacent to north (and actually wrapped around the plant) and boat yard 2500' to west. Much intensive housing and related open space and boating development has been proposed for Boston Sand and Gravel Co. lands to North and West. River and marsh access is good though probably through private land. River is one of the cleanest in Mass.

Noise levels and air quality. little noise, but strong septic smell from septage piled down wind from golf course.

Zoning and development issues. The marsh is in wetlands zoning. the Driftway (road) is generally zoned for business and light industry. A several hundred unit P.U.D. has been proposed for adjoining land to north and east. Concentrated residential use and extensive open space preservation seem the best uses for this area. Past town plans, present Dept. of Community Affair studies and the MAPC Open Space Plan all recognise the unique value of the North River Marsh. New or expanded plant should be kept low, present plant is nearly out of sight except for grit crane. A 15+ acre plant can fit if done very carefully with berms and natural plant material screening.


IMPACT MATRIX
SITE: Scituate
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Sudbury. USGS Quad Maynard, Concord

Watershed Sudbury River. Used in Concepts

Site Designation	1	2	3	4	5	All
						X

____ existing facility

____ explicit by M & E

____ explicit by others

__X__ interpreted by W & H.

Area available (if limited and known) Approx. 25 acres.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced proposed.

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 5.9, 2020 11.0, 2050 14.0.

Plant/Facility; needed area (acres)

2000 6.6

Plant/Facility; areas served Sudbury, Wayland.

Site Specifics:

Terrain: Nearly 100% flat open land of slightly higher elevation than adjacent marshland. A small steep hill on the northeast boundry is not suitable for development.

Vegetation: Open agricultural land with some (15%) wetland vegetation, i.e. maple, poplar, willow. Nearly surrounded by marshes.

Soils:

Special features: The site is basically a peninsula jutting into state and national wildlife refuge areas.

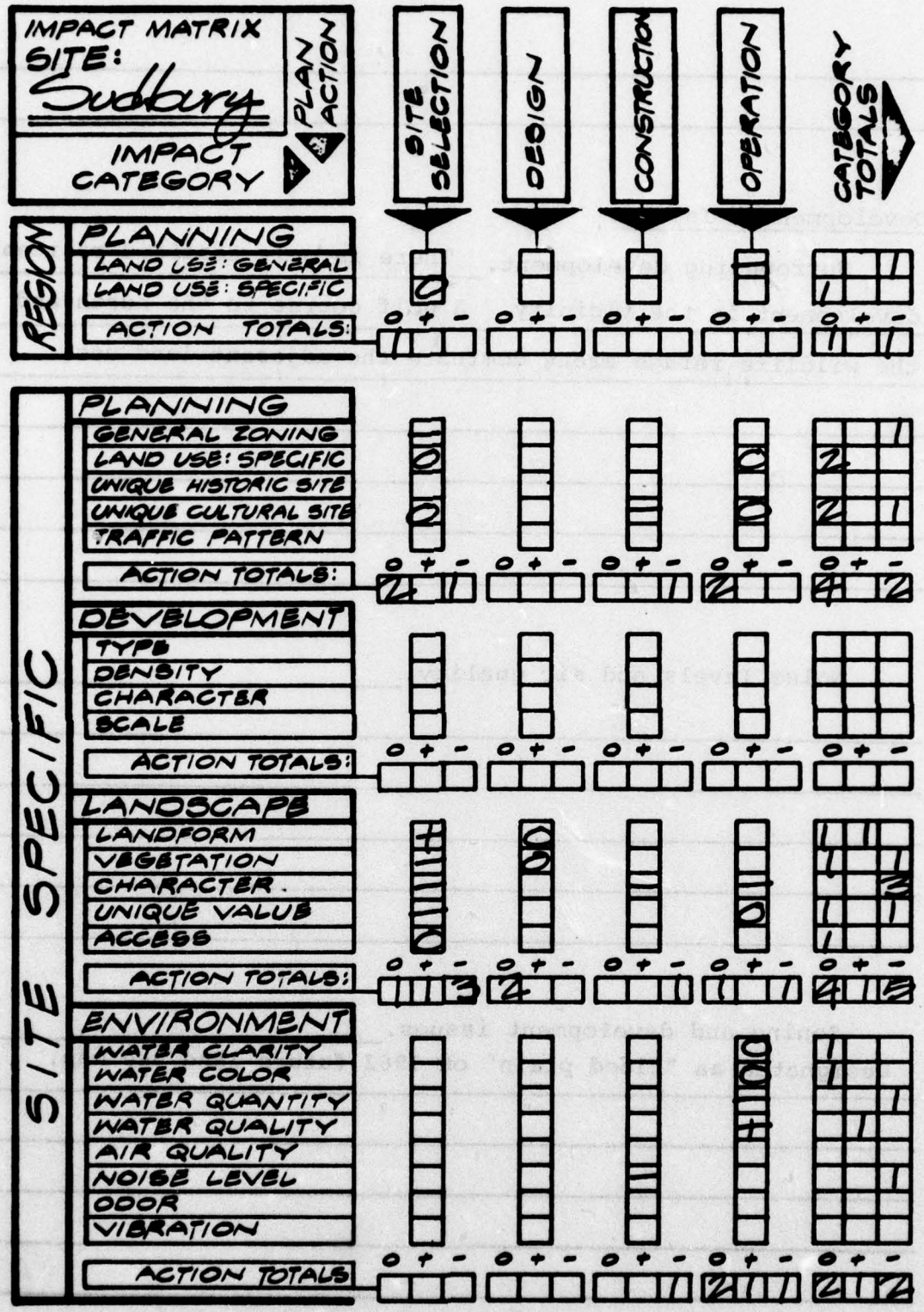
General site character: Very rural & open with views across the broad river marshes. Land is heavily wooded & interspersed with agricultural fields as one moves away from the river.

Developmental Issues:

Surrounding development. There is only scatterd residential development in the vicinity. A golf course to the north and the wildlife refuge areas dominate the adjacent land use.

Noise levels and air quality.

Zoning and development issues.
Designated as "flood plain" on 1962 future land use map.


IMPACT MATRIX
SITE:
Sudbury
IMPACT CATEGORY
PLAN ACTION
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Swampscott. USGS Quad Lynn.

Watershed North Coastal. Used in Concepts

Site Designation	1	2	3	4	5	All
X existing facility						X
___ explicit by M & E						
___ explicit by others						
___ interpreted by W & H.						

Area available (if limited and known) Approx. 1.9 acres.

Plant/Facility type

X Primary existing

X Secondary proposed

___ Advanced _____

___ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 3.2, 2020 3.3, 2050 3.6.

Plant/Facility; needed area(acres)

2000 3.2

Plant/Facility; areas served Swampscott

Site Specifics:

Terrain: flat

Vegetation: the site has low hedges on two sides and a few random deciduous trees.

Soils:

Special features: The site is the largest and most valuable property available in Swampscott. It was the site of the New Ocean House hotel, which burned several years ago.

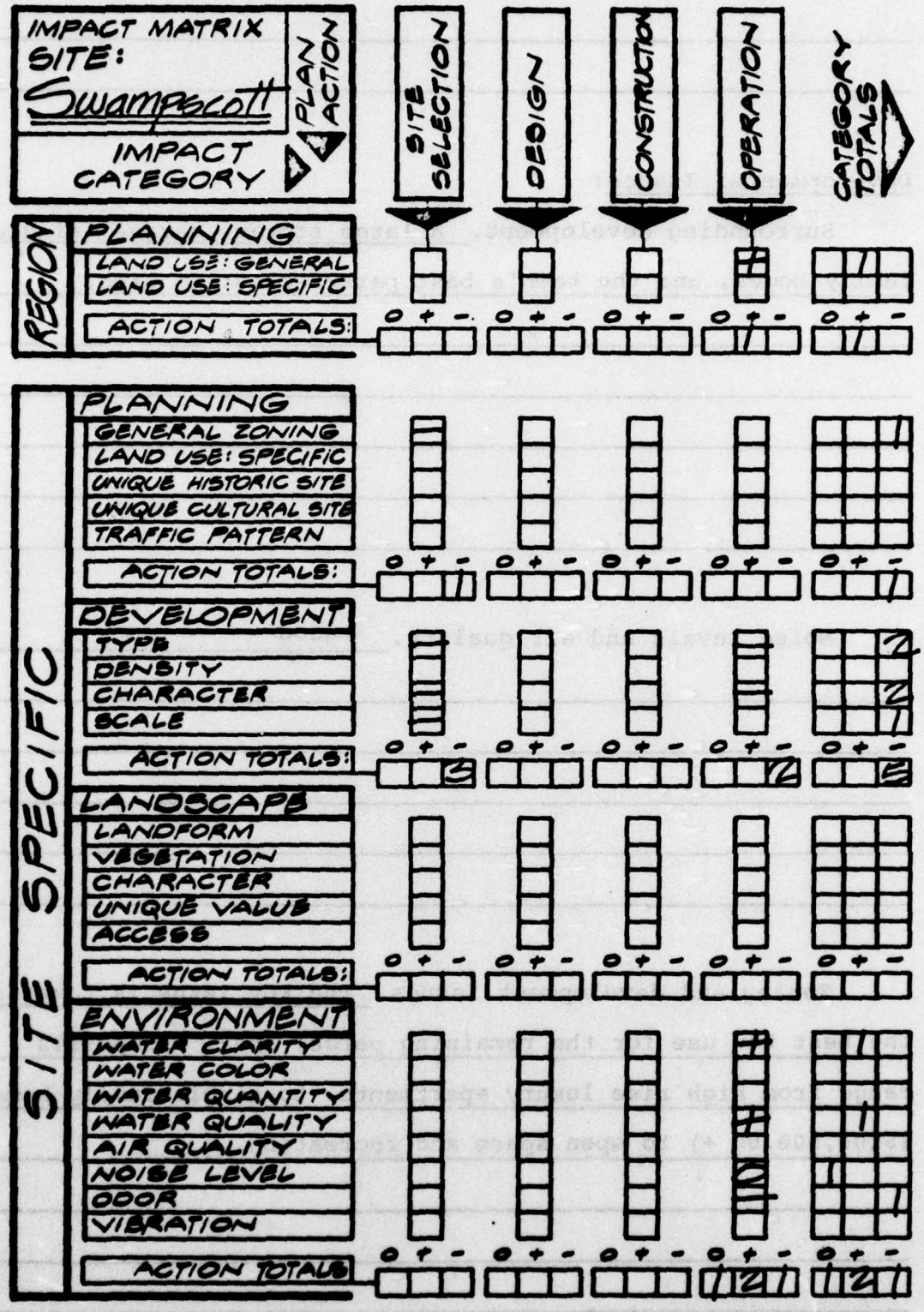
General site character: the site was a 9 hole practice golf course for the hotel. The plant has been built on end of the property, right on the main road to Marblehead.

Developmental Issues:

Surrounding development. A large storage garage, single family homes, and the town's best park/recreation area.

Noise levels and air quality. good

Zoning and development issues. The key issue is taxes and the best tax use for the remaining parcel area. Proposals range from high rise luxury apartments, to single family homes ($100,000.00 +) to open space and recreation.


IMPACT MATRIX
SITE:
Swampscott
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Watertown. USGS Quad Newton.

Watershed Mystic River. Used in Concepts

Site Designation	1	2	3	4	5	All
		X		X	X	

____ existing facility

____ explicit by M & E

__X__ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx 15 acres.

Plant/Facility type

____ Primary _____

__x__ Secondary proposed, Concept 5

__X__ Advanced proposed, Concepts 2,4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)
(2)45(4)45(5)34 (2)38(4)38(5)38 (2)38(4)38(5)38
2000_____, 2020_____, 2050_____.

Plant/Facility; needed area(acres)

2000 (2 & 4) 34

Plant/Facility; areas served All concepts; Lincoln, Waltham, Watertown, Weston and part of Newton

Site Specifics:

Terrain: 60% of the site is a low flat area of semi-wetland. The higher part appears to be a former land fill area. Change in grade is approx. 30' on a 90% slope.

Vegetation: The site is primarily covered by scrub growth, typical of an open field situation; mainly grasses, and a few shrubs and small tress.

Soils:

Special features: Sawins Pond might be preserved. Also the General Services Administration facility might severly limit this site's potential if it remains.

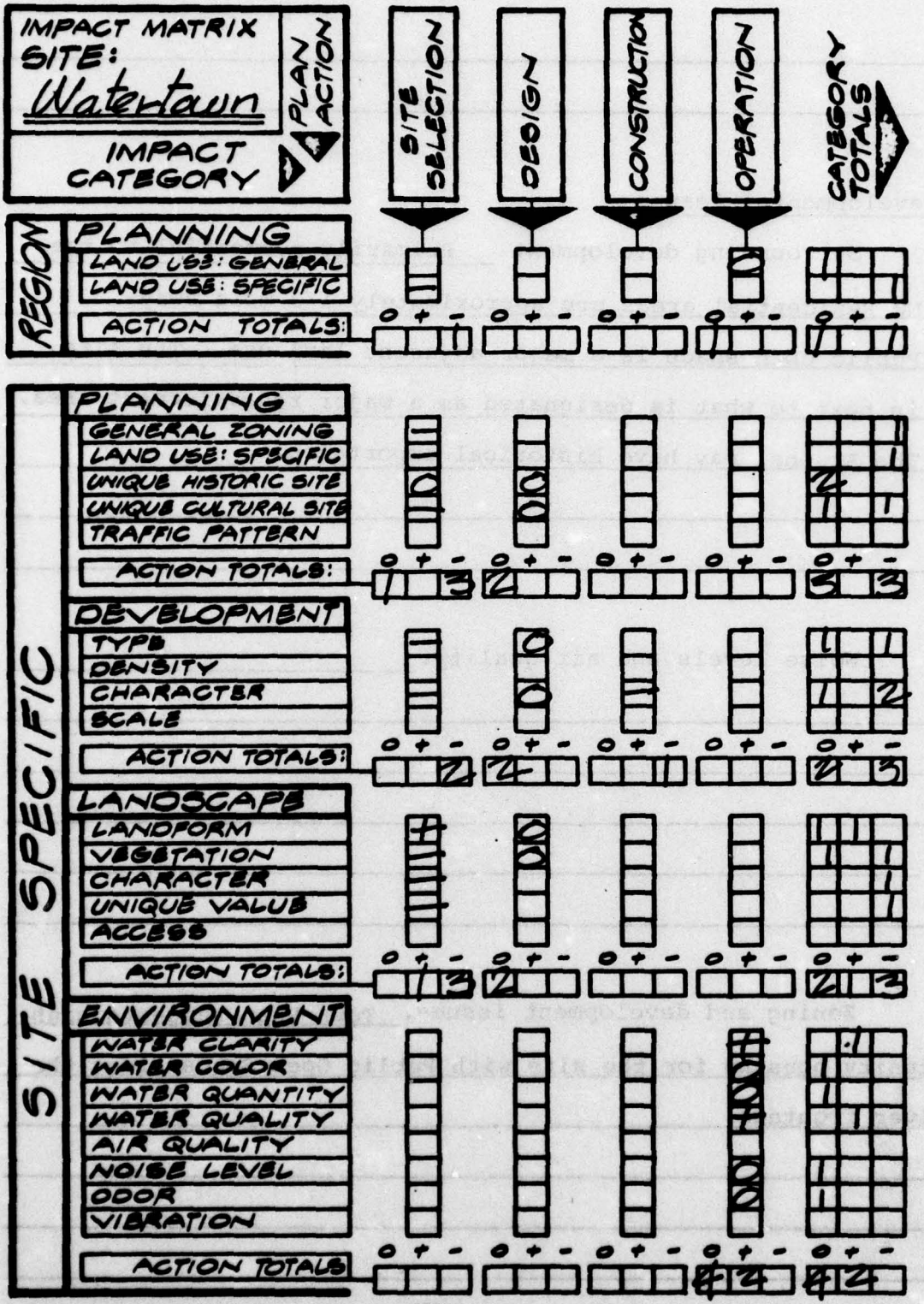
General site character: Due to its location along the Charles River, the area remains semi-rural inspite of adjacent commercial development. The landscape is low; a broad flood plain with fairly extensive views along the river to the northwest, the land rises with a significant change in grade.

Developmental Issues:

Surrounding development. Primarily commercial to the NW Residential areas are approximately 1/3 mile away. Public open space is a major adjacent land use. The site is next to what is designated as a major redevelopment area. The Arsenal may have historical importance.

Noise levels and air quality.

Zoning and development issues. Town Plan suggests high density housing for the site with Public Open Space along the river frontage.


IMPACT MATRIX
SITE: Watertown
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Woburn. USGS Quad Boston North.

Watershed Mystic River. Used in Concepts

Site Designation	1	2	3	4	5	All
____ existing facility						
_x_ explicit by M & E				X	X	
____ explicit by others						
____ interpreted by W & H.						

Area available (if limited and known) Approx. 25 acres.

Plant/Facility type

____ Primary _____

_x_ Secondary proposed, Concept 5

_X_ Advanced proposed, Concept 4

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 (4)31(5)25, 2020 (4)29(5)29, 2050 (4)27 (5)27.

Plant/Facility; needed area(acres)

2000 (4) 25

Plant/Facility; areas served Burlington, Reading, Wilmington, Woburn and parts of Stoneham, Wakefield and Winchester

Site Specifics:

Terrain: Gravel pit is basically flat with small indulations. 15% is low land bordering a river while remaining 25% is sloping land on 30% slope.

Vegetation: Limited vegetation; mostly open field scrub growth. Bordering up-land is forested with mixed hard/ softwoods. Marshlands lie between the site and the river.

Soils:

Special features: Open space reserve along the river.

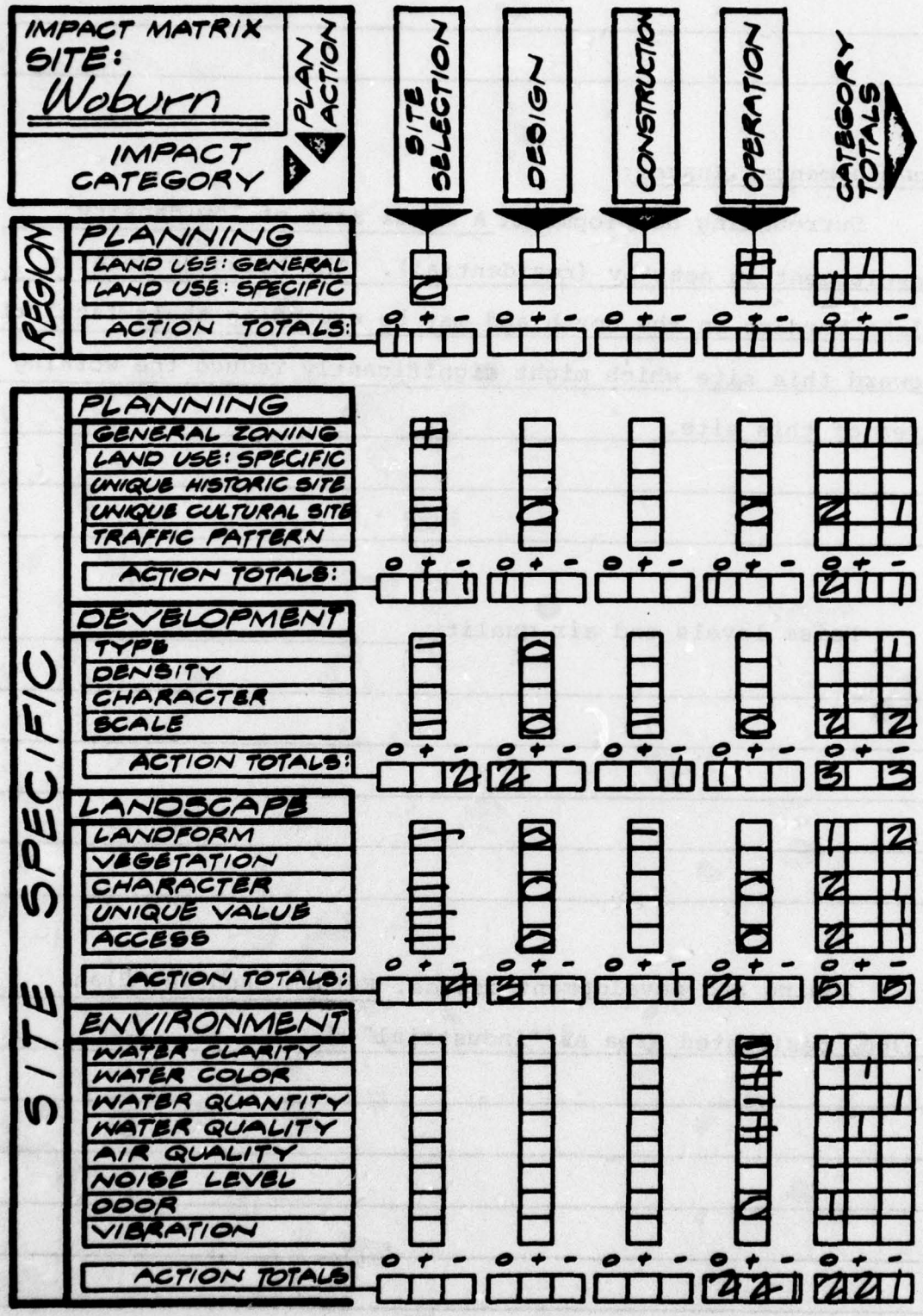
General site character: The landscape is that of a valley with a meandering stream. Open marshland is concentrated on the valley floor giving way to woodlands on the gentle slopes. Development of low density is encroaching but the area has remained rural in character and the site is both visually and physically secluded.

Developmental Issues:

Surrounding development. A small area of low density development is near-by (residential). The Atlantic Gelatin Plant borders on the north and may be expanding their facilities toward this site which might significantly reduce the working area of this site.

Noise levels and air quality.

Zoning and development issues. Future Land Use Plan, 1966, designated area as "industrial".


IMPACT MATRIX
SITE:
Woburn
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
O + -

APPENDIX B

BASELINE DATE

AND

COMPLETED MATRIX FORMS

FOR

ALL LAND APPLICATION SITES

CONCEPT FIVE

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Bourne-East. USGS Quad Pocasset.

Watershed Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
				X	

___ existing facility

___ explicit by M & E

_X_ explicit by others (W & H)

___ interpreted by W & H.

Area available (if limited and known) 2745 acres.

Plant/Facility type

___ Primary _____

___ Secondary _____

___ Advanced _____

___ Spray Irrigation _____

_X_ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

*2000 168.0, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

*2000 2745

Plant/Facility; areas served String of plants from Woburn to Canton proposed in concept 4, plus (via Dedham Plant) the area served by the Framingham plant under concepts 1, 2, & 4

*Site is part of a concept providing 252 MGD capacity to meet projected year 2000 demand of 177 MGD.

Site Specifics:

Terrain: Low, Rolling, relatively level

Vegetation: Mixed pine and hardwoods, low

Soils: Coarse sand

Special features: Part of a little used military reservation, some firing ranges in use now, basically open. Many reuses have been proposed for the base as a whole.

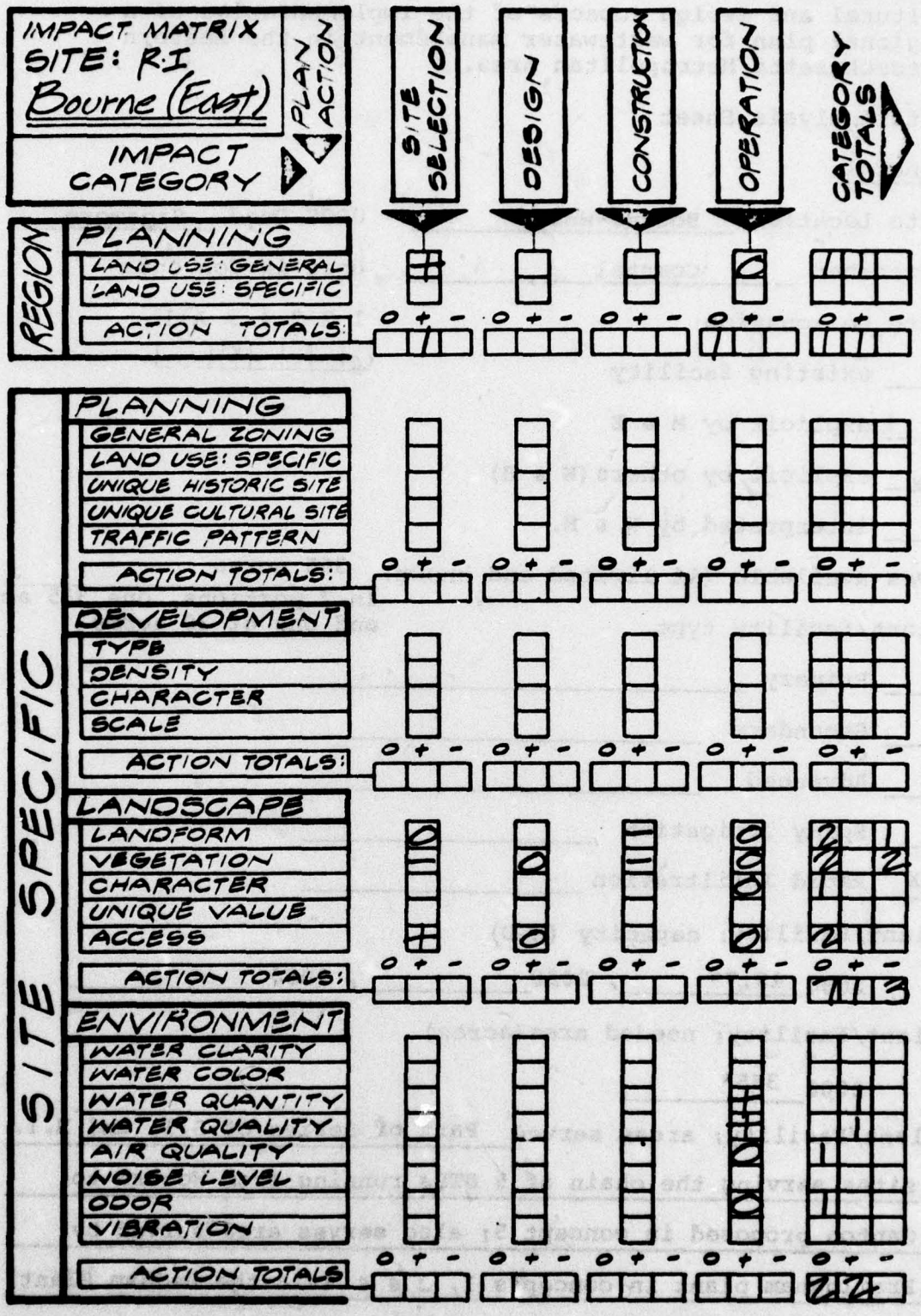
General site character: Dry scrubby, isolated

Developmental Issues:

Surrounding development. Open land on little used military base, Cape Cod Canal 2 miles to north, developed portion of Otis Field a mile to south, low density summer and year-round housing near Snake Pond 1/2 to S.E. of site.

Noise levels and air quality. Nothing notable now

Zoning and development issues. Despite many proposals for reuse of the airport, and of the residental and community facilities at the Base, most of the area (including the R.I. site) is open and lacks shore and pond amenities. Thus the site could probably be used without excluding other developments.


IMPACT MATRIX
SITE: R.I
Bourne (East)
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Bourne-West. USGS Quad Sagamore.

Watershed Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
				X	

___ existing facility

___ explicit by M & E

_x_ explicit by others (W & H)

___ interpreted by W & H.

Area available (if limited and known) 365 acres.
In 2 portions, one 335 acres and one of 30 acres

Plant/Facility type

___ Primary _____

___ Secondary _____

___ Advanced _____

___ Spray Irrigation _____

_X_ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 19.7*, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 365*

Plant/Facility; areas served Part of series of S.I. and R.I. sites serving the chain of 5 STPs running from Woburn to Canton proposed in concept 5; also serves area served by Framingham plant in concepts 1, 2 & 4 (via the Dedham Plant)

*Site is part of a concept providing 252 MGD capacity to meet 177 MGD in year 2000 projections.

Site Specifics:

Terrain: Hilly, sloping north and west from 150' to 40', generally slopes away from Cape Cod Canal.

Vegetation: Low mixed hard and soft woods, scrubby

Soils: Sandy, loose

Special features: Near Cape Cod Canal but oriented away from it.

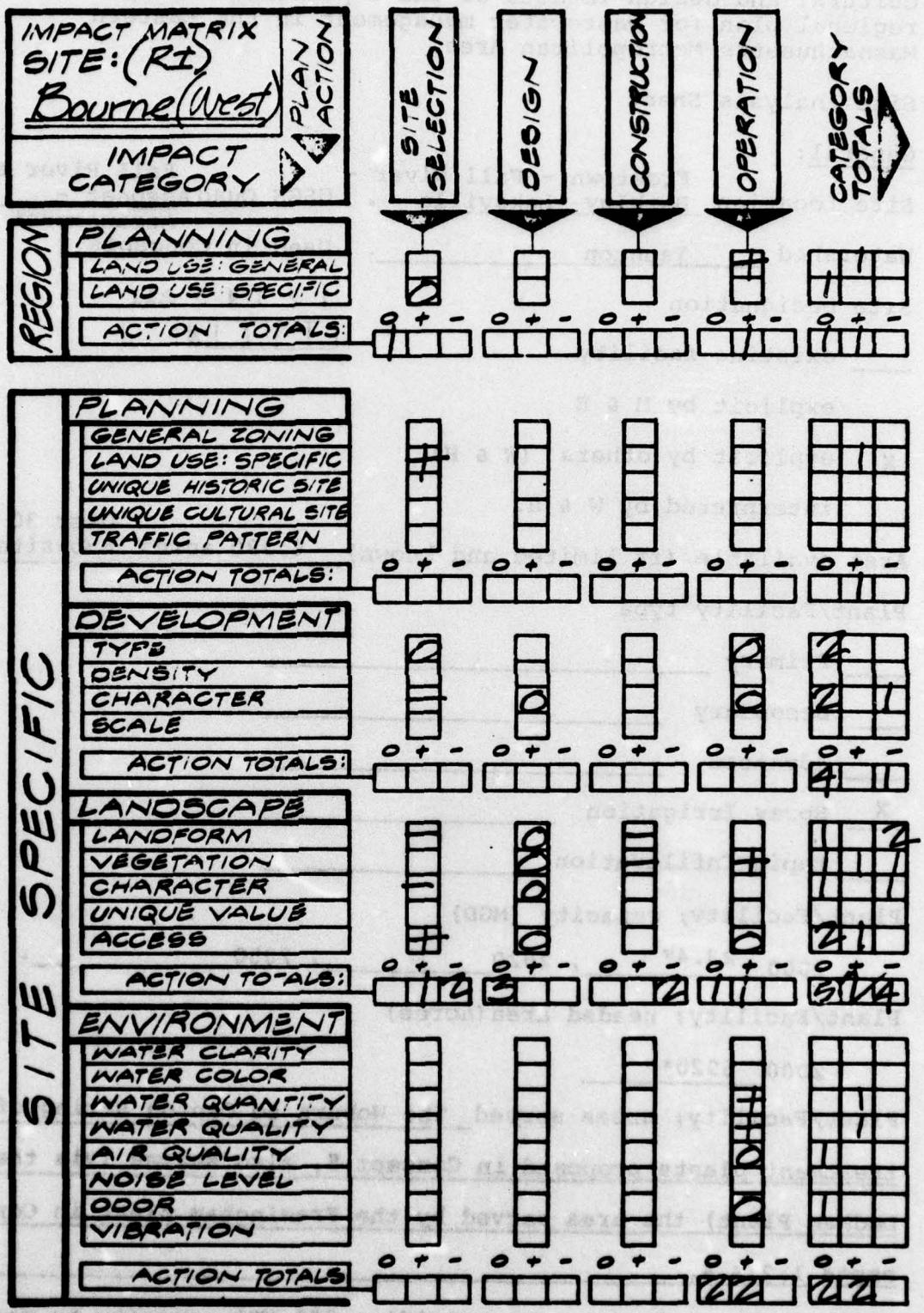
General site character: Rough, wooded

Developmental Issues:

Surrounding development. Town and federal open space to south along Canal with a small pocket of state land housing the State Division of Fisheries and Game Offices to north along Bournedale Rd. Commercial development to west at end of Canal and Bourne Bridge, site itself is an isolated pocket.

Noise levels and air quality. Some noise from Rt. 6 traffic

Zoning and development issues. 1966 town master plan proposed low density housing with some public open space to north outside of site, and commercial development along Rd. north of Bourne Bridge traffic circle. Since low density housing appears to be the residual use site seems consistent with local proposals. The proposed construction of Rt. 25 running N-S. between the main 335 acre portion of this site and Head of the Bay Rd. will remove the smaller 30 acre portion of the site. However it will also provide a good barrier enclosing this site on the west.


IMPACT MATRIX
SITE: (R1)
Bourne (West)
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Freetown - Fall River - Berkley--Lakeville. USGS Quad Fall River east; Assonet - Assawompset Pond.

Watershed Taunton. Used in Concepts

Site Designation

1	2	3	4	5	All
				X	

___ existing facility

___ explicit by M & E

_X_ explicit by others (W & H)

___ interpreted by W & H.

Area available (if limited and known) 6,290 acres Over 30 Sub-sites

Plant/Facility type

___ Primary _____

___ Secondary _____

___ Advanced _____

_X_ Spray Irrigation _____

___ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 23.4*, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

2000 6920*

Plant/Facility; areas served The Woburn to Canton string of treatment plants proposed in Concept 5, also serves (via the Dedham Plant) the area served by the Framingham plant in Concepts 1, 2 & 4.

*Site is part of a concept providing 252 MGD capacity to meet projected year 2000 demand of 177 MGD.

Site Specifics:

Terrain: Low hills and ridges running north and south interspersed with wet lands

Vegetation: Mixed hard and softwoods, some open fields

Soils: Stony, sandy loams

Special features: Proximity to water supply systems, (Watuppa Pond, Long Pond and Copicut reservoir.)

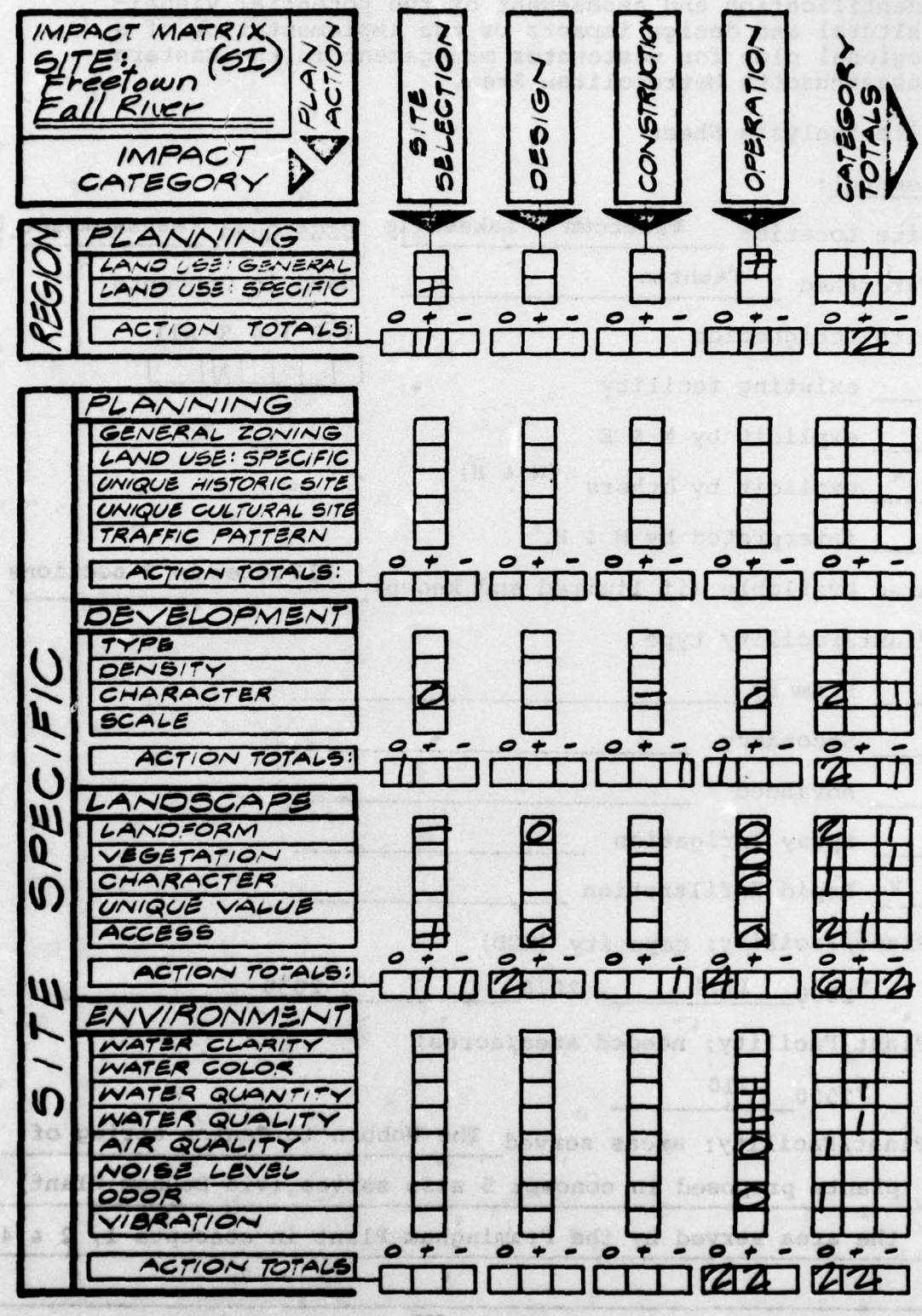
General site character: Fragmented sites running north and south between wetlands and along ridges and hillsides in a slowly growing rural area.

Developmental Issues:

Surrounding development. Public water lands, state forest and private vacant land. Limited access Rt. 24 cuts between 2 spray sites on Berkley, Freetown border, one cranberry bog west of major spray site on Freetown, Lakeville border. Spray sites occupy some high potentially developable but relatively inaccessable sites. (The more visible rapid infiltration sites will be screened by these spray sites.)

Noise levels and air quality. No significant noise or odor in area.

Zoning and development issues. Southeastern Mass. regional planning council staff seeks expansion of public lands south of Freetown - Fall River State Forest, in area proposed for spray irrigation and is concerned with protection of water supplies and cranberry bogs. Basically, land application seems compatible with expansion of public open lands, and with low density uses otherwise expected.


IMPACT MATRIX
SITE: Freetown Fall River (SI)
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Freetown - Lakeville. USGS Quad Assawompset Pond.

Watershed Taunton. Used in Concepts

Site Designation

1	2	3	4	5	All
				X	

____ existing facility

____ explicit by M & E

X ____ explicit by others (W & H)

____ interpreted by W & H.

Area available (if limited and known) 210 acres in 2 sections.

Plant/Facility type

____ Primary _____.

____ Secondary _____

____ Advanced _____

____ Spray Irrigation _____

X ____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

*2000 11.4, 2020 _____, 2050 _____.

Plant/Facility; needed area (acres)

*2000 210

Plant/Facility; areas served The Woburn to Canton string of plants proposed in concept 5 also serves (via Dedham Plant) the area served by the Framingham Plant in concepts 1, 2 & 4.

*Site is part of a concept providing 252 MGD capacity to meet projected 177 MGD year 2000 demands.

Site Specifics:

Terrain: Gently sloping from 150' to edge of swamp at about 90'

Vegetation: Mixed hard and soft woods, some fields

Soils: Loamy sand

Special features: Site brackets a railroad line

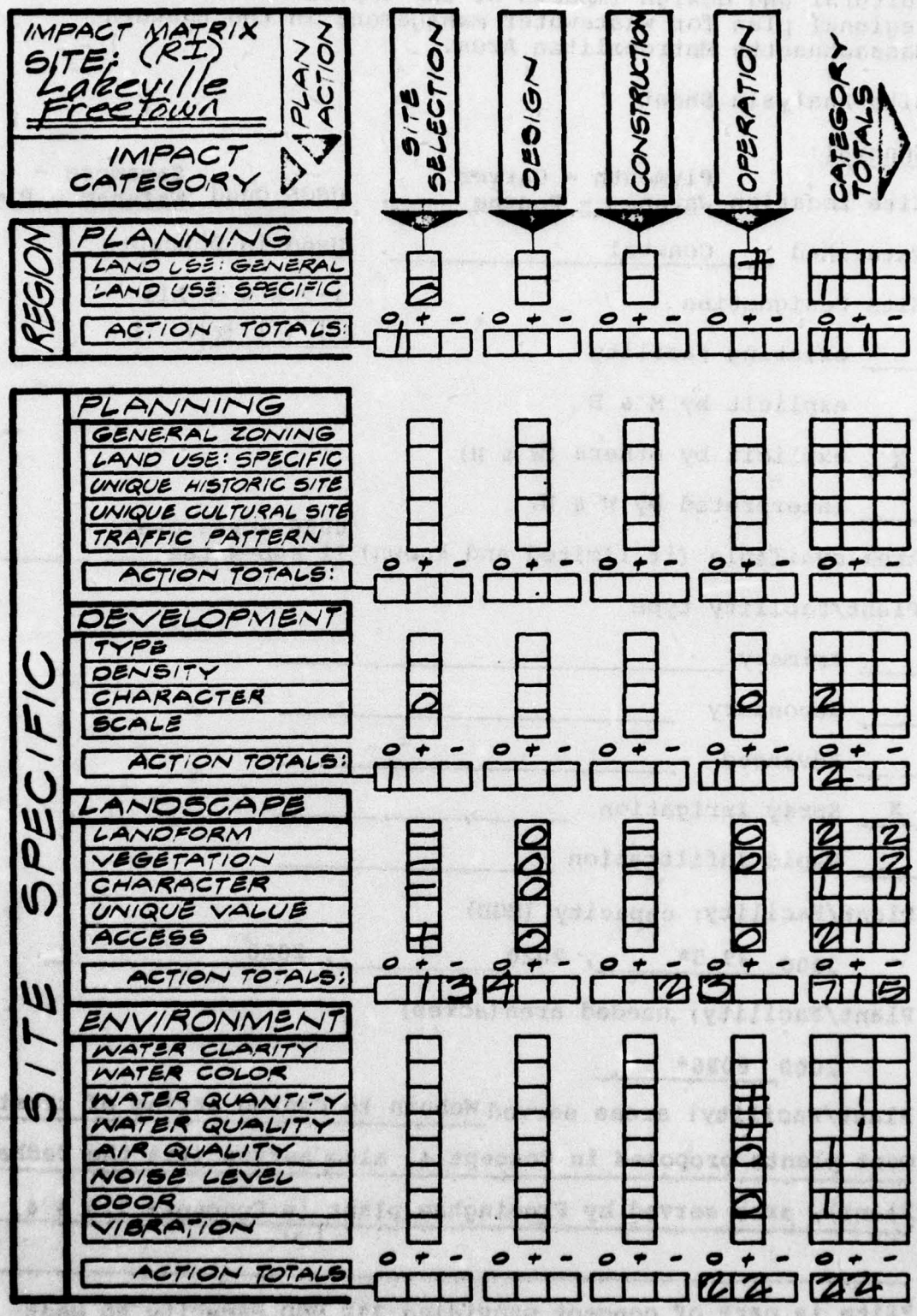
General site character: Gentle hillside in generally undeveloped area sloping to wetlands

Developmental Issues:

Surrounding development. Proposed spray areas and R.R. line surround western portion of site, eastern portion is between playfields of a regional high school, woods, and a swamp sites therefor are generally well screened.

Noise levels and air quality. Little present noise or odor.

Zoning and development issues. Sites will preclude development but land is relatively inacessible. South-eastern Mass. Regional Planning Agency is concerned about protection of nearby (1.5 mile) surface water supplies. It expects very limited development in the area due to poor access, slow growth and lack of utilities, thus site seems generally compatible in visual and land use terms.


IMPACT MATRIX
SITE: (RI)
Lakeville
Freetown
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Plymouth - Carver Wareham - Bourne. USGS Quad Sagamore - Wareham - Plymouth

Watershed Coastal. Used in Concepts

Site Designation

1	2	3	4	5	All
				X	

____ existing facility

____ explicit by M & E

__X__ explicit by others (W & H)

____ interpreted by W & H.

Area available (if limited and known) 8086 acres over 11 sub-sites.

Plant/Facility type

____ Primary _____

____ Secondary _____

____ Advanced _____

__X__ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility; capacity (MGD)

2000 29.5*, 2020_____, 2050_____.

Plant/Facility; needed area (acres)

2000 8086*

Plant/Facility; areas served Woburn to Canton string of treatment plants proposed in Concept 4, also serves (via the Dedham Plant), area served by Framingham plant in Concepts 1,2 & 4.

*Site is part of concept providing 252 MGD capacity to meet year 2000 projected 177 MGD need.

Site Specifics:

Terrain: Generally low and rolling, pocketed with many ponds and small dry depressions. Much of the largest sub-site (#4) is level with a few ponds in relatively steep sided depressions.

Vegetation: Generally low pine and hardwood, much new growth is in previously burnt-over areas, some nearby cranberry bogs.

Soils: Sandy, Coarse

Special features: Very dry permeable soil, extensive public holdings in the Myles Standish State Forest, many cranberry bogs.

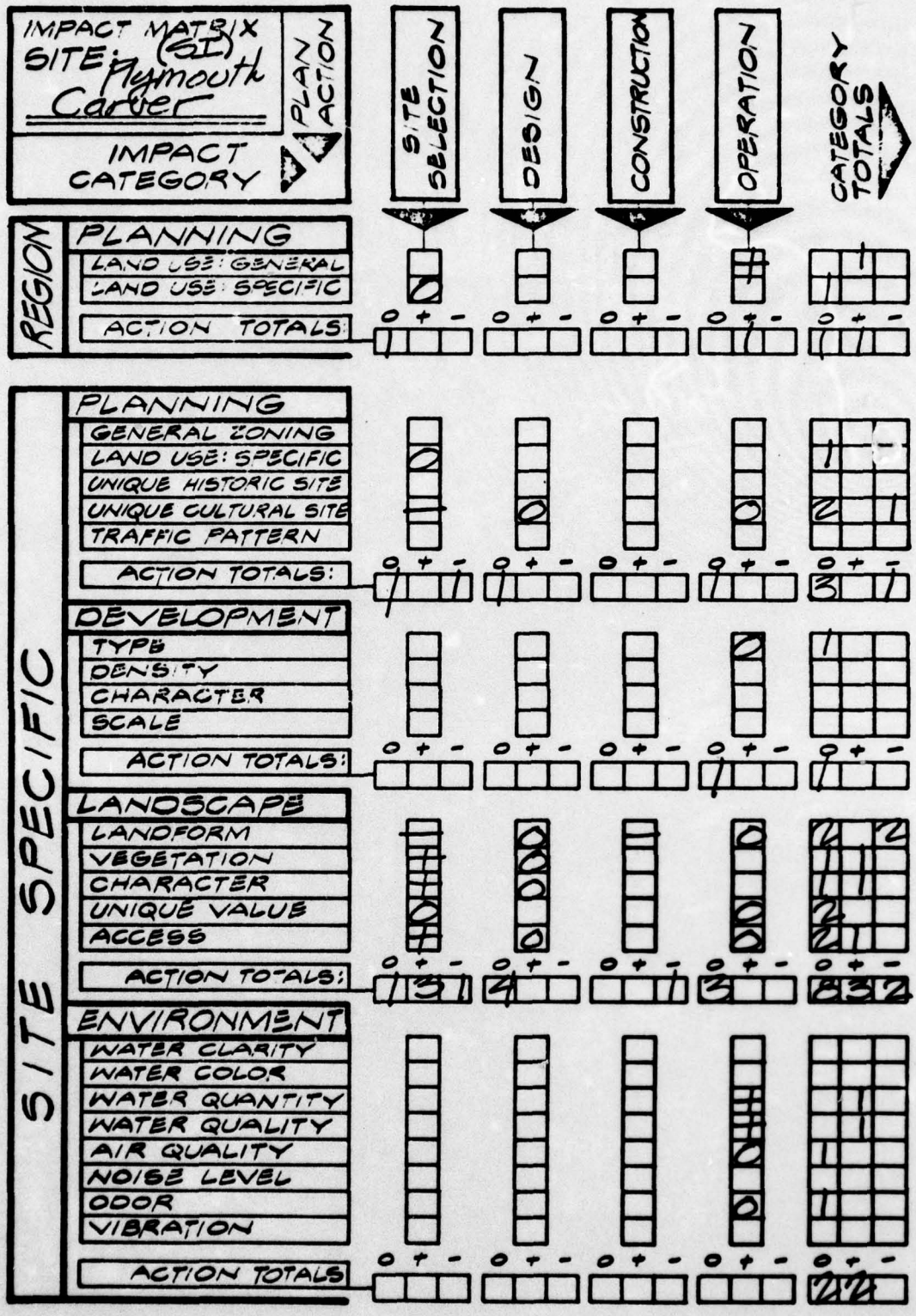
General site character: Rural, vacation oriented area, scrubby and parched low forest with streams, bogs, and ponds.

Developmental Issues:

Surrounding development. Much recreational development, paved bike paths, trails and camp sites in Myles Standish State Forest, many summer houses and camps around ponds, scattered new year-round housing and some subdivisions near major roads and ponds e.g., Heritage Hills near Sandy Pond and sub-site #7 and Seawood Pines near sub-site #4, and new houses along the road near sub-site # at Plymouth's Little Herring Pond.

Noise levels and air quality. No significant noise or smell was noted near any of the sites.

Zoning and development issues. Little conflict as most sites are in areas proposed for agriculture, low density housing, open space, or vacant land. Question is compatibility of spray irrigation with recreation use of some sites and its effects on gross vegetation. In several instances, spray use conflicts with specific housing developments. Spraying would also slow or divert some housing development by removing land from the market. The effect is probably greatest with major developments which are more likely to include extensive area of back-land as well as roadside and shoreline sites.


IMPACT MATRIX
SITE: Plymouth Carver (GI)
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -

APPENDIX C

BASELINE DATA

AND

COMPLETED MATRIX FORM

FOR THE

WELLESLEY PLANT/FACILITY SITE

THE SELECTED CONCEPT

Identification and assessment of the potential visual-cultural and design impacts of the implementation of a regional plan for wastewater management in the Eastern Massachusetts Metropolitan Area.

Site Analysis Sheet

General:

Site Location Wellesley. USGS Quad Natick.

Watershed Charles River. Used in Concepts

Site Designation 1 2 3 4 5 All

____ existing facility [ ][ ][ ][ ][ ][ ] Selected Concept X

__X__ explicit by M & E

____ explicit by others

____ interpreted by W & H.

Area available (if limited and known) Approx 40 acres.

Plant/Facility type

____ Primary _____

____ Secondary _____

__X__ Advanced Proposed _____

____ Spray Irrigation _____

____ Rapid Infiltration _____

Plant/Facility capacity (MGD)

2000 30, 2020 40, 2050 44.

Plant/Facility; needed area(acres)

2000 25, 2020 _____, 2050 _____.

Plant/Facility; areas served Natick, Framingham, Ashland, Hopkinton, Southborough, Wellesley (80%), plus Sherborn in the future.

Site Specifics:

Terrain: Small, low hill in center of site. Land slopes away to river on 3 sides. Slopes are moderate to gentle.

Vegetation: MIXED: evergreens & hardwoods on higher ground; shrubs & bushes on lower elevations; typical swamp & river edge vegation along portions of the river.

Soils: Probably alluvium: silty, sandy mixture

Special features: The site & its buildings are used by the Stigmatine Fathers. Conversion of facilities to school has been discussed in the past. In 1973, well tests indicated potential yield of over 1 million gpd of good quality water from north portion of site, next to the river.

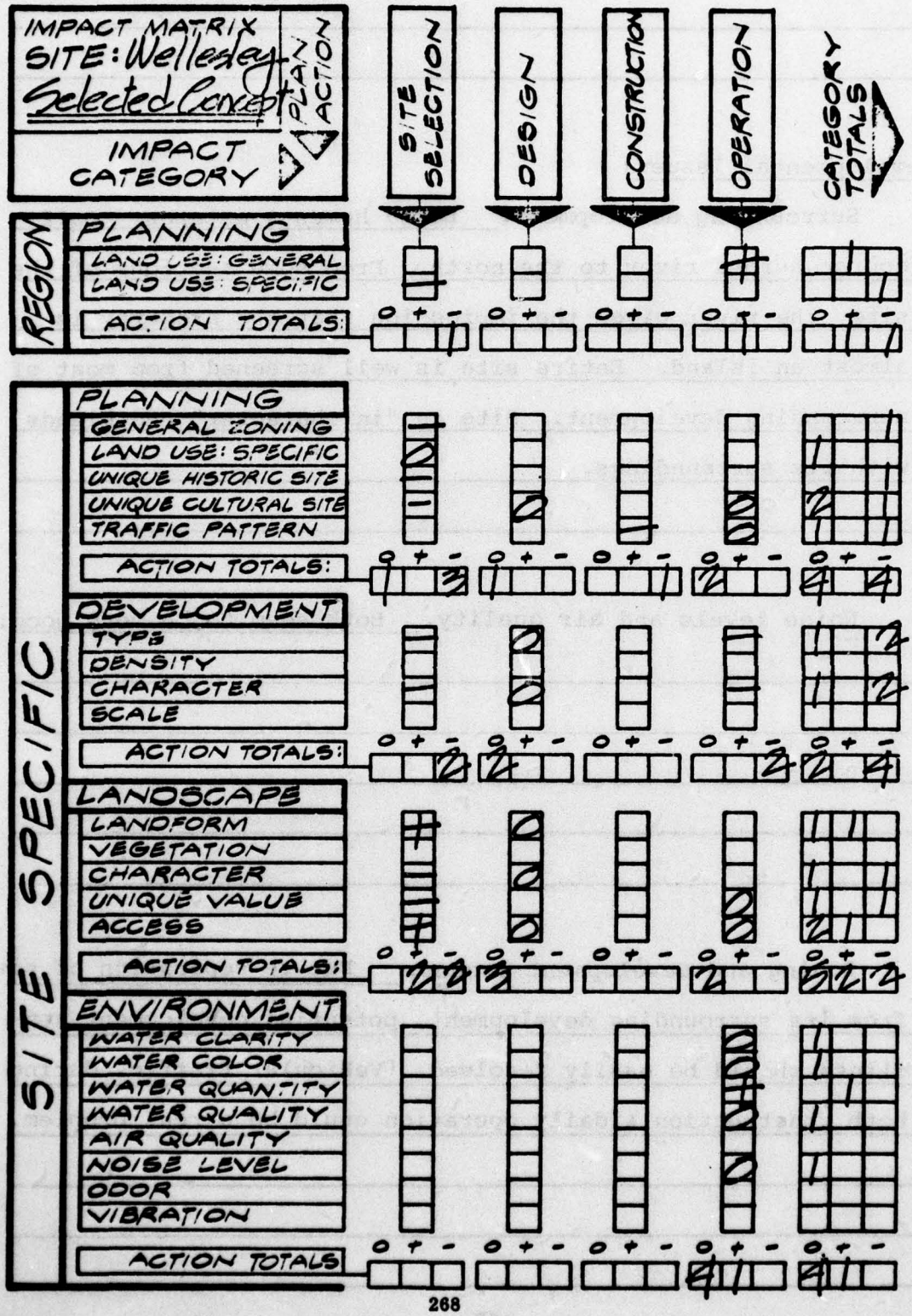
General site character: Secluded and very attractive; passive & quiet. Pleasing changes from open space to wooded areas. Buildings are set back & blend with the site. River is dominant from some views & is very important to site context.

Developmental Issues:

Surrounding development. Large homes & estates. Golf course across river to the north. From some sections of the site, the river gives the impression that the property is almost an island. Entire site is well screened from most of surrounding development. Site is "in character" and blends with its surroundings.

Noise levels and air quality. Both seem to be very good.

Zoning and development issues. Due to separation of site from its surrounding development, potential development conflicts should be easily resolved. Vehicular traffic, during both construction & daily operation could be a real problem.


IMPACT MATRIX
SITE: Wellesley
Selected Concept
PLAN ACTION
IMPACT CATEGORY
SITE SELECTION
DESIGN
CONSTRUCTION
OPERATION
CATEGORY TOTALS
REGION
PLANNING
LAND USE: GENERAL
LAND USE: SPECIFIC
ACTION TOTALS:
SITE SPECIFIC
PLANNING
GENERAL ZONING
LAND USE: SPECIFIC
UNIQUE HISTORIC SITE
UNIQUE CULTURAL SITE
TRAFFIC PATTERN
ACTION TOTALS:
DEVELOPMENT
TYPE
DENSITY
CHARACTER
SCALE
ACTION TOTALS:
LANDSCAPE
LANDFORM
VEGETATION
CHARACTER
UNIQUE VALUE
ACCESS
ACTION TOTALS:
ENVIRONMENT
WATER CLARITY
WATER COLOR
WATER QUANTITY
WATER QUALITY
AIR QUALITY
NOISE LEVEL
ODOR
VIBRATION
ACTION TOTALS
0 + -